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LINGUISTIC STUDIES OFFERED TO JOSEPH GREENBERG

edited by Alphonse Juilland

FIRST VOLUME: GENERAL LINGUISTICS

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JOSEPH GREENBERG

STUDIA LINGUISTICA ET PHILOLOGICA

editor

ALPHONSE JUILLAND

Stanford University

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FIRST VOLUME

GENERAL LINGUISTICS

Iosepho Greenberg,
viro imprimis docto atque humano, qui proprietates omnium linguarum communes summo studio, perspicacitate eximia penitus indagavit, hunc librum dedicamus
amici, discipuli, collegae

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Abbreviations

AA	*American Anthropologist*
Afr Stud B	*African Studies Bulletin* African Studies Association/Hoover Institution
J Afr L	*Journal of African Languages*
JAF	*Journal of American Folklore*
JOAS	*Journal of the American Oriental Society*
Lg	*Language*
MSLL	*Georgetown University Monograph Series on Language and Linguistics*
Southw J Anthrop	*Southwestern Journal of Anthropology*
WPLU	*Working Papers in Language Universals*, Stanford University

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The Blessing of the Lord Be upon You*

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The last two sentences of Psalm 129 are blessings, translated in the Revised Standard Version as follows:

> The blessing of the Lord be upon you.
> We bless you in the name of the Lord.

The commentators have offered various interpretations of these blessings, sometimes tentatively and sometimes with confidence that the interpretation is the true or correct one. In this paper we choose one interpretation as the most probable and examine some of its implications for cultural and linguistic change.

Blessings are understood here as performative expressions (Austin 1963, Searle 1969) by which either the speaker invokes divine favor on the addressee or other recipient or the speaker expresses praise to God for his attributes or works. They have played a prominent role in Judaism from the earliest times to the present: the 'blessed art thou' in various forms is addressed to individuals, groups or nations, material objects, and God. Blessings are fairly common in the Psalms and are subject to varying interpretations as to who was speaking them to whom, on what occasions, and with what intended effects (cf. Mowinckel 1967:II, 44-52 on blessings and curses in the Psalms). Each of the two blessings of Psalm 129:8 evokes these questions of interpretation.

Since the first blessing is in the context of the psalmist envisioning that the oppressors will someday be like withering grass on the housetops instead of a full harvest of grain and is asserting that no passerby will say this blessing at that time, the most natural interpretation seems to be that 'The blessing of the Lord be upon you!' was a formula of blessing customarily addressed to reapers or owners in connection with a good harvest. Indeed, this interpretation is given explicitly at least as far back as the 13th-century rabbinical commentary of Kimchi:

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* This paper is intended as a tribute to a side of Joseph Greenberg which is not widely known or appreciated: his interest in Jewish studies, in particular his knowledge of the Aramaic language and the traditional literature of Judaism. The first intimation I had of his familiarity with this field was on an occasion when I discussed with him the origins of the New Testament parable of Lazarus and Dives (Luke 16:19-31). As in so many other unexpected fields, his knowledge turned out to be rich and shaped by original insights. I hope this little study in *berākhōth* will also resonate with his more generally known interest in the place of language in culture change, as in his classic little article on Kanuri loanwords in Hausa (Greenberg 1960).

> . . . it is customary for those who pass by to say to the reapers *the blessing of the Lord be upon you*, just as Boaz greeted the reapers 'The Lord be with you' (Ruth ii 4). . . . Now this (manner of greeting) is not uttered in the case of *grass on the housetops*, for it does not flourish (lit. 'is not a seed of blessing') or come to the reaping stage. So shall it be with the gentiles, for all their dogmas and beliefs are without substance and worthless like the *grass on the housetops*. But as for Israel's *Torah*, this he [the psalmist] describes as a flourishing seed . . . (Baker & Nicholson 1973:37).

With the rise of modern Biblical scholarship this simple, plausible interpretation has receded, and other interpretations are often preferred. Some insist there was no special formula addressed to reapers and that this blessing was the normal way "in ancient Israel people greeted one another all year round" (Buttenwieser 1969:487). Others invest it with greater significance, for example that it refers to the blessing promised to Abraham and through him to all the families of the earth (Genesis 12:2) which will be denied to the evildoers who have spoken their own judgment (Lampater 1865:509). One of the interpretations farthest from Kimchi's is that of Weiser's widely respected commentary, which is so often judicious and sensible in interpretation but here seems to go astray:

> The psalm [129] is intended as a liturgical formulary of the Israelite covenant community . . . to be used in a cultic ceremony that ends in the cursing of those 'who hate Zion' and a benediction upon the congregation. . . . It may be assumed that the concluding verse of the liturgy was spoken by the priest. He pronounces upon the covenant community, called 'Israel', the blessing with which the congregation is dismissed from the sanctuary (Weiser 1962:770-772).

The second blessing, which I take to be a customary formula of response to the first (cf. Ferguson 1967, 1976), has been a perennial problem for translators and commentators. Most of them do not treat the second blessing as a response to the first. Even some of those who recognize the harvest-greeting nature of the first blessing are puzzled by the second. Modern English Bible translations use contemporary conventions of punctuation, including quotation marks, and the translators are forced to choose an interpretation. If we symbolize the two blessings by A and B respectively, then the three patterns of punctuation which appear are "A" "B", "A B", "A" B, of which the first presumably indicates that the two blessings constitute an exchange, the second that they are said by the same speaker(s), and the third that the second blessing is somehow outside the harvest-greeting situation. Of the dozen best-known contemporary English versions of the Psalms (listed below after the References), only the Jewish Publication Society translation and the English version of Gelineau have "A" "B", and only the Jerusalem Bible has "A" B; all the rest have "A B", which implicitly rejects the exchange interpretation adopted here.

Modern commentators may explain the second blessing as some kind of repetition of the first blessing for emphasis or poetic parallelism (e.g., Dahood 1970:233), as an alternate form or gloss of the first blessing which has worked its way into the text (e.g., Buttenwieser 1969:487), as the priest's blessing (e.g., Deissler 1965:III, 163 as an alternative), or as a blessing to be said by the readers or hearers of the psalm (e.g., van Zeller 1964:84). One argument for the interpretations which put the second blessing outside the situation is that the last line of the psalm seems outside the metrical or strophic structure, but this is hardly decisive in view of the variations in poetic form found throughout the Psalter.

The formulaic exchange of blessings on appropriate occasions is a well-known phenomenon in modern Arab culture. For example, in Arabic-speaking communities in the Syrian-Palestinian area one who announces or displays a new possession is greeted with *mabrūk* 'blessed!' to which he replies *'aḷḷa ybārik fīk* 'God bless you!'. This use of a blessing at the purchase or acquisition of a new possession is reminiscent of the traditional Jewish blessing prescribed in the Mishna, "One who has built a new house or bought new vessels says, Blessed be He who has kept us alive and preserved us and brought us to this season" (Simon 1958:373-374). The hypothesis proposed here is that the exchange of Psalm 129:8 is a cultural trait of long persistence in the Palestinian area. Specifically:

(1) A formula of blessing including the Semitic root *b r k* 'bless' is customarily addressed to someone who mentions, displays, or is evidently involved in a favorable event of nature such as a good harvest.

(2) The addressee or someone else present responds with another formula of blessing, echoing the root *b r k* of the initiating formula.

(3) The custom has persisted for at least two and a half millennia, through successive changes of language and religion. It has survived shifts in language from Hebrew to Aramaic to Arabic, and it has survived shifts in religion from Judaism to Christianity to Islam.

The use of a formula of blessing as a salutation on certain occasions is a well-attested phenomenon in speech communities using Semitic languages (Plassmann 1913:138-139; Lande 1949:9-11), and it is especially well documented for Arabic-speaking communities in the Syria-Palestine area (cf. e.g., Barthélemy 1935-1954 s.v. *b r k*). The details of structure and use of such formulas vary depending on the particular locale, but generally the formula includes the word *barake* 'blessing' corresponding to the Hebrew *berākhah* and Aramaic *birkethā*. The formula may consist simply of *lbarake* 'the blessing' or *barake* may be the subject or object of a verb (e.g., *ḥallit lbarake* 'blessing has opened', *'aḷḷa yiṭraḥ lbarake* 'may God place the blessing!'). Among the occasions on which a greeting formula of blessing is used are harvest scenes such as reaping grain, picking fruit, or simply talking of someone's good harvest and obvious prosperity (cf. Féghali 1935:126 fn.). The first blessing of Psalm 128:8 contains the noun *berākhah*: 'the *blessing* of the Lord be upon you', and is addressed to reapers of a harvest; it thus seems essentially the same in structure and use as the modern formulas.

The use of root-echo responses is also well attested in modern Arabic (Ferguson 1963). A root-echo response is typically a formula of the form 'God —— you!' in which the verb is of the same root as a key word in the initiating formula (e.g., *ma'ssalāme* '[go] with peace!', response *'alla ysallmak* 'God keep you!', echoing root *s l m*). The local Palestinian root-echo response for *b r k* is *'aḷḷa ybārik fīk* 'God bless you!', which is used to respond to formulas containing *barake, mabrūk,* or *mbārak* (for a fuller discussion of this formula cf. Ferguson, forthcoming). The second blessing of Psalm 129:8 contains the Hebrew verb *bērakh* 'bless' which echoes the noun of the first formula. The Hebrew response does not match the modern Arabic one exactly ('We bless you in the name of the Lord' instead of 'The Lord bless you') but the principle of greeting formula and root-echo response seems the same.[1]

It is difficult to document the continuation of a harvest blessing exchange during the long period between the composition of Psalm 129 and contemporary Arabic usage. The nature of the corpus of Aramaic/Syriac material from this period makes the location of evidence problematic, but given the large total corpus and its varied content we may hope that a specialist scholar will someday turn up a reference to this exchange of formulas. The use of expressions of blessing is well attested for Aramaic, and the substantial continuity of formulaic expressions such as proverbs and greetings from Aramaic into modern Arabic seems well established. The hypothesis of continuity of a harvest blessing exchange offers an interpretation of Psalm 129:8 which seems more plausible than any other.[2]

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[1] The Biblical Hebrew formula corresponding more exactly to the modern Arabic 'God bless you!' is 'The Lord bless you!', which occurs in Ruth 2:4 in response to the greeting 'The Lord be with you!'. This is not a root echoing exchange, but corresponds to the modern Arabic 'God be with you!' and its responses 'And with you!' or 'God preserve you!'. There is too little evidence to decide whether either (or both) of the Biblical blessing responses was a regular root-echo response of the modern Arabic type.

If our hypothesis is correct, it illustrates the special place of formulaic expressions in cultural change, notably their conservatism and their relative independence from shifts in language and religion. Every language used in the full range of communicative functions in a speech community includes in its total inventory a large number of formulaic expressions, more or less invariable routines whose direct referential meaning is less important than the appropriateness of their use on particular occasions. These formulaic expressions are of many types, including such well-known ones as greetings, expressions of thanks, requests for pardon, proverbs, riddles, stereotyped openings and closings of folktales, public acclamations, blessings, and curses. Such formulaic expressions, like other marginal phenomena in language, tend to show peculiarities of phonology, syntax, and lexicon setting them apart from the mainstream of sentences and discourse types to which linguists give most of their attention.

Formulaic expressions deserve study, however, as a part of synchronic linguistic description, if for no other reason than their universal presence in human languages and the corresponding need for linguistic theory to account for their structure and use; they also deserve study in connection with the processes of cultural (and linguistic) change. Like other marginal linguistic phenomena such as special 'registers', naming patterns, or magic charms, they may be borrowed suddenly from another language or they may persist in a speech community even through a total shift of language (cf. Ferguson 1976 for other examples).

The example of the final blessings of Psalm 129 illustrates the persistance of formulaic expressions in a community as long as the occasions for their use persist, regardless of changes in language and religion; it also illustrates the emergence of new interpretations when the verbal content is transmitted outside of the situational context. In this instance the sophisticated scholarly interpretations should yield to the straightforward, everyday understanding of the original author and singers of the psalm.

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[2] Since Ugaritic texts also have formulas of blessing with *b r k*, and early Canaanite agricultural practices must have been similar to those of ancient Israel, it may even be that the use of the harvest blessing exchange goes back to pre-Hebrew forms of Northwest Semitic and to the Canaanite religious settings which preceded Judaism, but finding clearcut evidence for this is even more problematic than for the later links in the chain.

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The International Sociology of Bilingual Secondary Education: Empirical Findings and Theoretical Implications

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This paper reports the findings of an empirical study of 100 of the 1,200 units located in conjunction with an international effort to locate bilingual schools at the secondary level. The principals or bilingual education directors of the 100 schools selected for study were asked to provide a great deal of information (440 items in all) about their communities, their faculties, their students, their programs and the languages used as media. Some of the information requested was factual. Some of the information requested was attitudinal. Every attempt was made to obtain exhaustive information in order to explore each of the above areas as fully as possible. The respondents knew that one in ten of the schools would subsequently be visited by the principal investigator — and that he would correspond further with them and with others knowledgeable about their schools — and this further tended to encourage full and accurate reporting.[1]

What did the study want to find out?

Description in itself is not enough; description must have a goal, a purpose, a focus. Similarly, although there is still a great need for detailed information about secondary bilingual education, whether in the United States per se or internationally, description alone, without focus, is not well calculated to answer questions. What questions did the International

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[1] For a complete technical presentation of the research procedures and findings discussed here, see Chapters V and VI of the detailed Final Report to the Office of Education, DHEW, on research conducted under contract OECO-73-0588, completed September 1974 and entitled "A Sociology of Bilingual Education". The current presentation will also constitute Chapter IX of my forthcoming *Bilingual Education: An International Sociological Perspective* (Rowely, Newbury House, in press).

Study of Bilingual Secondary Education (ISBSE) seek to answer? Briefly put, it sought to find the particular descriptive details and dimensions that were most useful (or powerful) in explaining (or predicting) three criteria that are of prime interest to all those concerned with bilingual education. The three criteria upon which all of the ISBSE data was focused were as follows:

Criterion I: Absolute Academic Success, i.e., what are the averaged grades awarded across all subjects and all years of study?

Criterion II: Relative Academic Success, i.e. how do bilingual secondary schools compare to monolingual secondary schools in their immediate areas serving comparable populations insofar as averaged grades are concerned?

Criterion III: Student Satisfaction, i.e., how pleased are students with respect to their bilingual secondary schooling in terms of its impact on their academic, personality and social development?

In connection with *Criterion I* the ISBSE data sought to find the descriptive information that differentiates best between academically outstanding and academically less outstanding secondary bilingual programs. All bilingual programs cannot be excellent any more than can all monolingual programs. What kind of descriptive details and dimensions are most important in differentiating between secondary bilingual programs along a continuum of academic success — when academic success is measured in terms of the averages of all grades awarded across all subjects and all years of study? Certainly this is a question of wide interest and great importance.

Criterion II is similar to *Criterion I* except that it is concerned with academic performance on a *comparative* basis. Some bilingual education programs are as good as or better than monolingual education programs in their immediate areas serving comparable populations; others are not. What kinds of descriptive details and dimensions are most important in differentiating between secondary bilingual education programs in terms of their *relative* academic success in comparison to their monolingual 'competitors'. This criterion pertains to a question that is often asked of bilingual education and empirical data pertaining to it — particularly, empirical data on an international basis could be very revealing.

Criteria I and *II* both deal with the academic (cognitive) goals of bilingual education. However, our concern for bilingual education as a whole, and for secondary bilingual education in particular, cannot and must not be reduced to the cognitive domain alone. Accordingly, *Criterion III* deals with student satisfaction, i.e., with the affective domain of education, and does so relative to a very inclusive formulation of educational goals (academic, personality and social development). What descriptive details and dimensions pertaining to secondary bilingual education programs will best differentiate between programs for which high student satisfaction is claimed and programs for which low student satisfaction is claimed? This was the third major question for which the ISBSE sought an answer.

All in all, therefore, the ISBSE attempted to utilize an exhaustive battery of descriptive information in order to differentiate between more and less outstanding secondary bilingual programs on three fundamental criteria of 'goodness' of education. From the findings obtained, to be discussed, below, we should be able to tell, first of all, whether these three criteria are really as separate as they appear to be. After all, it is at least theoretically possible that they are all one and the same, i.e., that the programs achieving absolute academic success, relative academic success and high student satisfaction are one and the same, and that the descriptive details differentiating best between them on one criterion are also the same as differentiate best between them on the other criteria as well. Or it may be that the three criteria are really substantially independent. It would be interesting to know whether schools must really aim at three separate goals or whether success on one criterion brings the others automatically into range as well. Finally, it may be that the criteria are negative interrelated and that schools must choose between them because too much of one is counterproductive with respect to the other(s).

If the three criteria are at least *substantially* separate it would certainly be enlightening to know what are the descriptive details or dimensions that are uniquely related to optimal differentiation with respect to each. Which criterion, e.g, is best predicted by *student* characteristics, and by which student characteristics? Which criterion, if any, is best predicted by *teacher* characteristics, and by which teacher characteristics? the same question must be asked about *program* characteristics, *community* characteristics and *language* characteristics. Are all of these types of characteristics equally important in predicting all criteria, or are some more important for one criterion and others are more important for another? Indeed, are the types of characteristics (of students, teachers, programs, communities, languages) really independent of each other, or are they really groupable into fewer and different clusters than those that appeal to us intuitively?

Let us see what was found in connection with these fundamental issues in the international sociology of secondary bilingual education.

How were the hundred programs selected?

This is not the place to enter into the many delicate and complicated methodological issues and procedures involved in gathering 400 bits of information from 100 bilingual secondary schools throughout the world and in processing and analyzing the data so obtained. However, there are a few such issues that must be addressed, albeit briefly and simply, and one of these is how the 100 programs were selected and how many of them replied. The latter question is easier to reply to: ultimately, almost all (94, to be exact). As for the former question, let us consider the data that permitted the preparation of Chapter VIII of *Bilingual Education*. The 1,200 secondary education units identified there were initially clustered according to the *intensity considerations* (transitional, uniliterate, biliterate), the *goal considerations* (compensatory, enrichment, group maintenance), and the *one population vs. two population* distinction, which has been commented upon in Chapters III and IV of *Bilingual Education*. The 100 units studied were then selected by sampling at random from the above 12 clusters (3 × 2 × 2 = 12) in such a fashion as to maximize the number of countries represented. All in all, this approach was utilized in order to locate a random stratified sample of bilingual secondary programs that would, on the one had, represent all of the intuitive types and, on the other hand, be as varied as possible on geographic-political-cultural grounds. Data obtained on such a sample should yield international findings that are not only interesting but also instructive, since the basic stratificational parameters (e.g., intensity type, goal type, country, etc.) also become possible descriptive parameters whose predictive potential can be empirically examined vis-a-vis the criteria we have just reviewed.

Are the three criteria separate and predictable?

Obtaining 400 bits of information from a stratified random sample of roughly 100 respondents relative to three criteria is in itself no guarantee that the information obtained will actually predict (explain, clarify, account for) those criteria. As every teacher (and researcher) knows, it is possible to ask countless irrelevant questions. Similarly, it is possible to gather much information that is of no explanatory value whatsoever, interestingly descriptive though it may be. How did the ISBSE fare in this connection? Quite well indeed. The data collected yielded cumulative multiple correlations of .89, .91 and .80 in conjunction with Criteria I, II and III, respectively, which is to say that it succeeded in accounting for 79%, 83% and 64% of the variation from one school to the other on these three criteria.

Thus, if we are interested in accounting for the differences in selfreported absolute academic success, relative academic success and student satisfaction in secondary bilingual programs the world over (and we are), then we can safely say that the kinds of data we have collected go a long way toward doing exactly that. Indeed, it is rare to obtain cumulative multiple correlations as high as these in psycho- and socio-educational research, and since ours is but the beginning of research on the international sociology of bilingual education, we may conclude that the prospects for explanatory-predictive power in this area are certainly promising.

Further encouragement in this connection is obtained from the fact that the inter-correlations between the criteria themselves are very low (from -.03 to .05). This fact assures us that we are dealing with criteria that are not only separate intuitively but functionally as well. The fact that one cannot predict one criterion from the other means that secondary bilingual programs' *absolute* academic success does not yet tell us anything about its *relative* academic success or about the level of *student satisfaction* encountered therein. Furthermore, student satisfaction with a secondary bilingual program does not yet tell us anything reliable about either its absolute or relative academic success. Inter-school differences on these criteria (and that is *what* we are trying to account for) are explained or predicted by appreciably separate and independent sets of descriptive information, and it is to a review of these sets that we now turn.

Four hundred measures: ten factors

How many different bits of information can you actively keep in mind at one time, in terms of the differences and interrelations between them? Whatever the answer may be in any individual case, it is definitely below 400. Can you imagine trying to understand, remember and explain findings based upon 400 means and standard deviations, as well as upon the $\frac{n(n-1)}{2}$ or 79,800 intercorrelations between the distributions from which they were obtained? Can you imagine doing so not only once but *three times*, once for each criterion? Our mathematical-statistical procedures have far outstripped our human mental capacity to make sense of the figures that computers spew out with such seeming effortlessness. Fortunately computers will also do what we ask them to do in order to help us understand and assimilate their massive outputs. Thus, after the computers had finished working with all 400 bits of information, in conjunction with each criterion individually, in order to answer the above questions regarding criterion separateness and predictability, they were then asked to composite these 400 measures so that ordinary human minds could work with them conceptually. The compositing method employed is called factor analysis. You may have heard of it. It is a boon to the researcher who has more data than he can fathom and who would like to combine conceptual parsimony with the computer's endless capacity for handling descriptive detail.

In effect we said to our servant the computer: "Although 400 measures were taken of each secondary bilingual program, it may well be that many of these were redundant or overlapping in greater or lesser degree. What then is the *smallest number of maximally different* measures or dimensions in our data?" These latter measures, composited out of the intercorrelations between original measures, are called factors, In our case 'our servant' came back and reported that there were *ten* factors (see Table I)that could account for almost all of the variation in our original 400 measures. Now *ten* dimensions are far easier for human flesh and blood to assimilate than 400. Therefore, it is with these ten that we will continue our discussion of findings. First let us see what they can tell us about each criterion, that is, how they can help us understand the differences that exist between secondary bilingual programs in connection with absolute academic success, relative academic success and student satisfaction.

TABLE I: REVIEW OF FACTORS

Factor I	Two different mother tongue populations, neither resident in the immediate vicinity of the school, both appreciably represented in student body.
Factor II	Stress on total ethno-cultural value of *marked* language and commitment thereto.
Factor III	Stress on total ethno-cultural value of *unmarked* language and commitment thereto.
Factor IV	*Marked* language represents literary ethnic emphasis while *unmarked* language represents ethnically neutral activity.
Factor V	Language of a comfortable minority dominates education and is therefore *unmarked.*
Factor VI	Bilingual education starts at secondary level and therefore *unmarked* language must initially be used even for *marked* group-related courses.
Factor VII	Stress on technological value of *marked* language.
Factor VII	Stress on economic and international functions of *unmarked* language.
Factor IX	Numerically significant and modernized language already known by many students is instructionally *marked.*
Factor X	Language maintenance stress on *marked* language.

Marked and unmarked languages

One of the most striking facts about the above named ten factors is that four of them (II, VII, IX, X) deal with what we will refer to as the *marked language*, four others deal with what we will refer to as the *unmarked language* (III, V, VI, VIII), and, finally, the remaining two factors deal, directly or indirectly, with both the marked *and* the unmarked language (I, IV). Since this distinction between marked and unmarked is obviously crucial in understanding the dimensionality of secondary bilingual education, let us stop for a moment to clarify it so that we may better be able to refer to it and to utilize it in our further discussion.

In earlier discussions of bilingual education much stress has been given to the difference between *mother tongue* and *other tongue*, as well as to the interaction between that distinction and yet another, namely, the difference between *major language* on the world scene (English, Russian, French, Spanish, Chinese and Arabic) and *minor language* on the world scene (all others). The latter category is sometimes further subdivided between languages of established standardization and modernization (e.g. German, Swedish, Japanese) and languages whose standardization and modernization are still recent or yet to come (e.g. Amharic, Hebrew, Nynorsk). The entire import of the above twofold (or threefold) distinction is that while it may be true that "a rose is a rose is a rose", it is *not* true that "a language is a language is a language". Presumably students, teachers, parents and politicians alike react differently to a language, in the classroom and outside of it, depending on whether it is their mother tongue or not, whether it is powerful on the world scene or not, and whether or not it has long been authoritatively codified and attuned to the needs of modern technology. Presumably bilingual education that involves languages with 'plus ratings' on all of these attributes will have 'easier sledding' than bilingual education involving languages with 'minus ratings'.

The *marked* vs. *unmarked* distinction is related to the foregoing three but different from them in that it is basically more responsive to a very pervasive-but-subtle socio-educational fact, namely, that *every bilingual education setting involves languages of differential school-relatedness in that particular setting*. It is precisely because of the fact that in any particular vicinity one language is more likely to be the mother tongue of most students than the other, and precisely because one is more likely to be stronger than the other on the world scene (particularly for international technological and fiscal functions), and precisely because one is more likely than the other to be at a more advantaged stage of sociolinguistic development that the *marked* vs. *unmarked* distinction comes into being, since, indeed, it cuts across all of these more customary distinctions.

That language is *marked* in a bilingual education setting which would most likely *not* be used *instructionally* were it not for bilingual education, i.e., to say, it is precisely bilingual education that has brought it into the classroom. Conversely, that language is *unmarked* in a bilingual education setting which would most likely (continue to) be used instructionally, even in the absence of bilingual education. Many advocates (as well as critics) of bilingual education have focused their attention upon the marked language (as well as upon the marked speech community whose mother tongue it is). One of the most surprising findings of the ISBSE study is that the factor-analyzed data obtained from directors of a highly variegated sample of bilingual education programs throughout the world reveal that unmarked language and unmarked speech community considerations are probably equally important, if not more so, with respect to the criteria here studied. This has not received sufficient stress in the past.

The factors as descriptive dimension

Now that the marked-unmarked distinction and the crucial importance of both of its polar extremes are clearer to us, we can return to our ten factorial dimensions of secondary bilingual education, seek to understand them better, and ultimately put them to use in conjunction with the criteria that are the focus of this inquiry.

Each dimension calls to mind the bilingual education setting in a particular country or region, although, quite clearly, each school would necessarily have *some* loading on every factor. Thus, Factor I is evocative of well-known bilingual schools located in cultural capitals or in regional centers, which often have some boarding students as well, but which more usually serve students who have left their nuclear families and are living with friends and relatives near the school itself. University-connected schools of this type are not unusual in those African and Asian countries in which the vernaculars are used instructionally either alongside one another or alongside some Western language. Seemingly, what is of importance is the *combination* of two populations, each with its own mother tongue, *and* the fact that they are both living away from home. It is such a combination of two superficially *separate* items into a single dimension that factor analysis is peculiarly well suited to highlight.

As Table II below indicates, examples of school types that would doubtlessly be characterized primarily by each factor are not difficult to suggest, although it must be stressed that in reality few, if any, schools would be adequately describable on *one* dimension and on *one alone*.

However, the major achievement of factor analysis is not in the naming of the factors that have been mathematically derived to begin with (the naming process *is* a bit of a conceptual achievement — not to mention a

TABLE II: FACTORIAL TYPES OF BILINGUAL SCHOOLS (HYPOTHETICAL)

Factor I	University-affiliated Afro-Asian bilingual schools drawing to them two different mother-tongue populations.
Factor II	Welsh stressing bilingual schools, Hebrew stressing bilingual schools in diaspora.
Factor III	German-French bilingual schools in West Germany.
Factor IV	German bilingual schools abroad.
Factor V	Most bilingual schools in Francophone Africa or in Anglophone Africa.
Factor VI	U.S. bilingual programs admitting Anglos for the first time in Junior High years and stressing ethnic studies.
Factor VII	English stressing bilingual schools in Latin America.
Factor VIII	Bilingual oriented programs primarily for minorities residing in LWC (Language of Wider Communication) contexts.
Factor IX	French immersion bilingual programs in Quebec.
Factor X	Irish stressing bilingual schools.

source of gratification in view of the fact that elucidative naming is not always conceptually possible — but it inevitably forces an element of verbal uncertainty or infelicity upon what is essentially an elegant product of a good deal of quantitative work),[2] nor even in the further verbal explication of these factors, but in their utility as explanatory or predictor variables in conjunction with criteria of crucial concern. It is to this topic that we now turn our attention.

The factorial dimensions as criterial predictors

We have said earlier that our 400 bits of descriptive data did yeoman service in accounting for interschool variation on each of the criteria under study. We now return to this topic in terms of the factorial dimensions involved. What dimensions are most significant in connection with which criteria? Table III answers this question very parsimoniously.

For each criterion three factors are of greatest predictive significance. Interestingly enough, each criterion is best predicted by a *combination* of both *marked* language and *unmarked* language factors. Furthermore, some factors which are positively related to Factor I (which deals with absolute

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[2] For a sound non-technical introduction to the quantitative side of factor analysis as applied to social research, see R.J. Rummel. 1967. "Understanding factor analysis". *Journal of Conflict Resolution* 11.444-480.

TABLE III: PATTERN OF MOST PRODUCTIVE PREDICTORS
FACTORIAL CLASSIFICATION

Average order of entry	*Criterion I*	*Criterion II*	*Criterion III*
First Most Powerful	Factor VII − (U)	Factor X − (M)	Factor IV + (B)
Second Most Powerful	Factor II + (M)	Factor IV + (B)	Factor V + (U)
Third Most Powerful	Factor V − (U)	Factor III + (U)	Factor II − (M)
Entirely Absent	Factor I	Factor I	Factor I
	Factor VI		Factor X

U, M and B indicate whether factor deals with the Unmarked, Marked or Both languages. + or − indicate whether factor is positively or negatively related to criterion.

academic achievement) are negatively related to Factor III (student satisfaction).

Absolute academic achievement seems to depend on a delicate balance between the attention given to the marked and unmarked languages, such that the former is genuinely and vigorously accepted, curricularly speaking, while the latter, though clearly dominant in the larger society surrounding the school and even surrounding the nation, is nevertheless not overdone. The message seems to be clear: overall absolute academic achievement is a reflection of performance on *all* subjects and it is particularly the marked language subjects and efforts that require extra attention (acceptance, encouragement, recognition) in order to hold up well academically.

For the purpose of greatest absolute academic success, the unmarked language subjects and related efforts may actually need to be played down somewhat at school since they get more than ample support from contextual forces that permeate the school as well as the major formal and informal institutions of society as a whole. Academic excellence in these areas is not as school-dependent (upon school budgets, school time, school personnel, school rewards, etc.) as is academic excellence in the marked language subjects and related efforts.

The most productive predictors pertaining to relative academic success provide a nicely complimentary picture to that which we have just reviewed in connection with absolute academic success. If bilingual secondary education is not only to be of high academic quality in its own right, but if it is also to compete academically with the monolingual secondary schools in the same area and serving comparable populations, then a different set of predictors and, indeed, a different predictive constellation is involved. For the purposes of such relative-competitive success, it is the marked language subjects and related efforts that must not be overstressed. Obviously, it is precisely in connection with marked language subjects and the entire atmosphere pertaining to the marked language that bilingual schools differ from monolingual ones. If *too much* is made of this difference, non-bilingual secondary schools may not be able to compete with the monolingual ones in those areas in which they share common goals (e.g., achievement in unmarked language subjects and, perhaps therefore, achievement in college admissions examinations pertaining to such subjects).

Does the foregoing mean that there is an inevitable conflict between Criterion I and Criterion II goals for bilingual secondary education? Perhaps so, if either goal is carried to an extreme. That there need be *no* conflict is clear both from the fact that these two criteria are hardly related to each other in our data as well as from the thumbnail sketches given in Appendix 1 to *Bilingual Education* (see particularly sketches 3 and 4 dealing with the newer Welsh bilingual schools). That there *can* be conflict between academic goals is clear even from monolingual secondary schools in which a given area of excellence (science, music, art) is developed at the expense of all else. Thus, this *is* a matter to watch. If attention to the marked language 'gets out of hand' (and let us remember, the marked language need not be an oppressed or disadvantaged minority language; in much of the world it may be English or French or Russian) the price that will need to be paid, in relative-competitive terms, may be one that will ultimately redound to the disadvantage of bilingual education itself. Once again we note that what is involved is a matter of balance, a sensitive matter, a matter of judgment. Certainly we should expect no less from bilingual education than that it be mature in these respects, and certainly such maturity has been reached in many schools in all parts of the world. There is a built-in tension in bilingual education, a built-in proportionality requirement. This is fortunate: it keeps bilingual education on its toes and keeps it from becoming complacent. It is also a built-in self-corrective: it keeps bilingual education from becoming monolingual.

The built-in balance in bilingual secondary education is not only conceptually required but it is also a desideratum for student satisfaction. Criterion III is best predicted by factors that overlap with each of the other two criteria (whereas the first two criteria are best predicted by totally different subsets of factors). The greatest overlap is with Criterion I (but note that the directional significance of each shared factor is opposite in connection with Criterion III from what it was in the case of Criterion I). The configurational upshot in the prediction of student satisfaction is that both curricular balance within the school and societal allocation of language functions in the community as a whole are highly desirable contexts for bilingual education in general and for bilingual secondary education in particular.

It is also noteworthy that student satisfaction is higher when the marked language represents ethnicity (literature, history, culture, tradition) than when it represents technology. Bilingual education yields more student satisfaction (as well as more relative academic success) when the minority mother tongue is marked and ethnically justified than when English, French or another Language of Wider Communication is marked and is technologically justified (Factor VII) or is unmarked and is economically justified on other grounds (Factor VIII). Languages of Wider Communication may be desired and admired; only languages of ethnicity are loved. All languages can be hated because of their symbolic associations; only the languages of real or imagined intimacy can be loved. Bilingual education must arrive at or reinforce a modus vivendi between marked and unmarked languages (and often between ethnic and supra-ethnic languages). It cannot afford to become confused with self-indulgent romanticism and rejection of the 'outside' world. That is not what either marked languages, ethnic languages or bilingual education need.

Predictively useless factors

It should be clear from our discussion thus far that some factors are predictively less useful than others. Least useful of all is Factor I (which never contributes at all to the prediction of any criterion). Factors VI, VII and IX never make a *major* contribution to the prediction of any criterion, although they do make more minor contributions of this kind. Obviously there are dimensions of bilingual secondary education which, although they *are* dimensionally significant (i.e., they *do* accurately reflect real characteristics of bilingual secondary schools in some parts of the world, and, therefore, *are* needed in accounting for the differences between such schools on an international basis), are *not* significantly related to the three criteria that we have investigated. Perhaps there are other criteria for which these dimensions would be predictively useful (e.g., community support, staff satisfaction, etc.). This possibility remains to be studied in the future.

Relating criteria to intuitive item types

Factor analysis often cuts across a priori intuitions. It sometimes brings together items that investigators did not initially realize were highly related to each other. It sometimes separates apart items that investigators assumed to pertain to the same topics. This is precisely the value of factor analysis. It is an empirical approach to confirming or disconfirming the pre-existing dimensionality assumptions and hypotheses (conscious or unconscious) of the investigator. However, in the final analysis every good researcher is also a bit of an artist. He cannot work satisfactorily only with objectively and quantitatively separate dimensions, any more than he can, as a scientist, work only with intuitively constituted dimensions. All research consists of a fruitful and gratifying combination of both types of dimensions and of a creative tension system (hopefully not a conflict system) between the two. Thus far in this study we have dealt only with empirically-quantitatively derived dimensions or factors. Let us now take a glance at what our intuitive dimensions (program characteristics, student characteristics, staff characteristics, community characteristics and language characteristics) can tell us about the criteria that are of concern to us.

TABLE IV: PATTERN OF MOST PRODUCTIVE PREDICTORS
A PRIORI CLASSIFICATIONS

Criterion	*Most powerful Category*	*Next most powerful Category*
Absolute Academic Achievement	Comm/Lang Items	Student Items
Relative Academic Items	Comm/Lang Items	Program Items
Student Satisfaction	Program Items	Student Items

A glance at Table IV reveals many interesting facts in this connection. On an overall basis, community-language characteristics loom most powerful. They are the major predictors for both academic achievement criteria. Program characteristics are next most powerful. They constitute the major predictors of student satisfaction and substantial predictors of relative academic success. Finally, student characteristics are of tertiary importance since they contribute substantially both to the prediction of absolute academic success as well as to student satisfaction, although they are not the primary predictors of either. Clearly it is the staff characteristics that wind up last on all counts since these seem to contribute importantly or substantially to none of the criteria we have studied.

The latter finding is not an artifact of asking too few or unimportant items dealing with staff characteristics. On the contrary: many questions were asked dealing with this topic, and these included all the facets of staff background, training, certification, remuneration, experience, and interests that have been mentioned either in the general or in the bilingual education literature. Neither was there any lack of variation in our data with respect to staff characteristics. The implication must therefore be retained, that the other topics studied are generally much more powerful than are staff characteristics insofar as accounting for interschool variation on the criteria we have studied. Perhaps this is because staff characteristics are akin to 'a scalpel in a butcher shop', i.e., they are simply too delicate to make a difference when pitted against such powerful factors as the others under consideration. Perhaps we also need to re-examine our staff-training efforts in order to give staff far greater technical expertise than they may now possess in the secondary bilingual education context.

The relative impotence of staff characteristics assumes greater credibility when we compare such characteristics with the community and language variables which seem to be of greatest predictive importance. Here we are dealing with such truly powerful considerations as the proportion of the population that have the unmarked language as mother tongue, whether the unmarked language is of importance for international communication, the proportion of parents of unmarked mother tongue who are professionals or semi-professionsl, the proportion of the unmarked mother tongue population that already knows the marked language prior to secondary school, etc. Clearly, educators must not despair of their role in bilingual education in general or in bilingual secondary education in particular. Rather, they must realize that in large part the success of such education is dictated by very powerful and pervasive societal and language considerations (language-in-society considerations, if you like) — macro-factors, we might call them — and that it is only after these can be controlled (as they are in many local situations) that staff characteristics can come to the fore and enjoy the prominence that they deserve. Perhaps educators have too often been expected to perform miracles under societally impossible conditions. To know one's limitations is the beginning of wisdom in capitalizing on one's strengths.

A precautionary note in parting

How much stock can we put in the findings of the International Study of Bilingual Secondary Education, given two limiting considerations: its data is of the self-report variety and its sample is rather small? Certainly the findings should not be oversold. Indeed, it would be well to honor them more for provocativeness and novelty rather than in terms of any purported conclusiveness. Certainly, like most initial research, they raise at least as many questions as they answer — and that is as it should be.

Nevertheless, neither the small sample size nor the self-report nature of the data can be the *reason* for any of the findings we have reported. The respondents to the ISBSE questionnaire were not aware of the criteria being investigated since these were never identified as such to them. The reliability and validity of their responses were generally confirmed (and, indeed, the respondents were informed that these would be looked into via personal visits to a 10% subsample, as well as via further correspondence with them and with others in their areas). Neither small sample size nor self-reporting is conducive to the high multiple correlations obtained nor to the conceptual clarity of the factor analyses. Obviously, had more data of the same kinds been collected via more precise methods, even better predictions and clearer factors would then have obtained. However, the predictive-explanatory levels attained are already extremely high and rather than requiring apology of any kind, are sufficiently solid to provide a good point of departure for detailed follow-up research.

Types of bilingual secondary schools

One of the findings derived from our factor analyses serves the same reassuring function as do 'marker factors' in factor analytic research more generally. Normally, factor analysis is utilized for fields of inquiry where a certain few dimensions *are* known but many others are *not*. If the analysis yields any of the known factors, then greater confidence can be placed in the newly derived but previously unknown ones. Thus, if numerous measures were taken of all the rooms in a hotel, a factor analysis of these measure should yield the factors of length, width and breadth, in addition to any other factors that might be forthcoming (other dimensions might also obtain due to rooms with curved walls, with curved or open ceilings, with more or less window space, with more and less door space, etc.). The 'marker dimensions' of length, width, breadth tend to engender confidence in the other, more unexpected dimensions. In our case we built into our sample selection the dimensions of compensatory, enrichment and language maintenance program types. No such factors appeared when the 400 bits of data for each school were factor analyzed. On the other hand, when the nearly 100 responding schools were themselves factor analyzed (that is, when the question was asked: "What types of bilingual secondary schools are there?" rather than "What are the dimensions of bilingual secondary education across schools?"), three distinct groupings appeared which were easily characterizable as compensatory, enrichment and language maintenance in their factorial characteristics. This 'marker' finding, reflecting as it does something built into our data collection, is not only reassuring. It is also a substantive finding in its own right. It implies that program types — real though they be — are themselves not definitive of criterial performance and not closely related to variation in community, staff, student, program or language characteristics. This too is worth knowing, particularly at this early stage of the game.

Conclusions

What have we learned from the International Study of Bilingual Secondary Education that we did not know before? Quite a few things.

1. The criteria of absolute academic success, relative academic success, and student satisfaction can be predicted with very high accuracy on the basis of socio-educational and socio-linguistic data.

2. The overall dimensionality of secondary bilingual education is almost equally related to the marked and the unmarked languages involved in such education.

3. Maximal prediction of the criteria studied by the ISBSE requires a very careful balance of attention to both marked language subjects and related efforts, on the one hand, as well as to unmarked language subjects and related efforts, on the other hand. This remains basically true even though both relative academic success and student satisfaction require somewhat greater attention to the unmarked language and absolute academic success to the marked language.

4. Student satisfaction is greatest when the marked language is related to ethnicity and its intimacy rather than to technology and its impersonal efficiency.

5. The most powerful characteristics for predicting the criteria of concern deal with community-language and program considerations. Least powerful of all are those characteristics of secondary bilingual education that deal with staff considerations.

6. Program types (compensatory, enrichment, language maintenance) are not powerful criterial predictors. There are good and poor schools of each of these types.

Given the relative numerical infrequency of bilingual *secondary* education in comparison to bilingual *primary* education throughout the world, it must be asked whether the above findings apply equally well to the latter as to the former. There is no evidence concerning this question at the moment, and certainly such is greatly needed. Nevertheless, the findings enumerated above appear to be of such fundamental conceptual validity that their applicability to bilingual elementary education, at least in part, would seem to be very probable.

The Word and its Definitions

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The fate of the word in modern linguistics has been full of vicissitudes. Taken for granted in traditional grammar where the only question was how to define it, "the central element of the language system" (Ullmann 1959:46) sailed into rough waters with the emergence of structuralism. The more rigorous standards imposed by the new outlook on word-centered models of grammar signalled the beginning of a period of severe challenge during which many structuralists did all in their power to do away with the unit traditional linguists thought was "aus der Sprache nicht fortzudenken" (Ammann 1925-8:29). It was a period during which the traditionalist defenders of a unit without which "une langue serait inconcevable" (Doroszewski 1949:136) were reduced to sporadic rescue operations aimed at preserving at least some of the more important descriptive, historical, and comparative functions fulfilled by the word in traditional grammar (Juilland 1976). Some tried to dispense with the word altogether by reassigning its descriptive functions to the smaller morpheme and to the larger phrase;[1] others looked for one or more intermediate substitutes, larger than the morpheme but smaller than the phrase;[2] only a few remained faithful to the unit which "the average person regards as an old friend" (Bolinger 1963:114), and even fewer were bold enough to take up the challenge and seek an 'operational' definition capable of satisfying the more demanding requirements of the new science of language.[3] Significant for the disappointing results of their efforts is that the question rests nowadays just about where the scholar whose sixtieth birthday we are honoring in this volume had left it not long after he had celebrated his fortieth (Greenberg 1957).

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[1] "Some linguists . . . argue that since the morpheme must be recognized anyway as the minimal unit of grammar, in many cases smaller than the word, grammar is better built on this unit with the word occupying a less important position [if any], along with such larger groupings as the phrase and the clause." (Ross 1949:491).

[2] "The only way to avoid misunderstanding and self-contradiction is to make up our minds to replace the elusive term word by three fixed terms: *monolog, polylog,* and *miolog* whenever we wish to differentiate" (Palmer 1917:39).

[3] Cf. §5 The word reinstated, in Juilland and Roceric 1976.

The turmoil subsided with the coming of generative and transformational grammar. Combined with a healthy scepticism toward the 'discovery procedures' which had undermined the conventional word by failing to verify it consistently, the transformationalists' tendency to rely on native intuitions was bound to favor "the element of language which the native speaker feels that he knows best" (Bolinger 1963:115), the only element "obvious to the layman" (Seiler 1964:767), the only element about which "native speakers have an intuitive awareness" (Palmer 1972:132),[4] the only element which can be isolated by a native Indian[5] or segmented by an illiterate.[6] Alas, the expected comeback failed to materialize when transformationalists, perhaps because of their structuralist heritage, preferred to resort to the morpheme as a basis for lexical representations instead of returning to the traditional unit of the lexicon, the conventional word.

Recently, however, there have been signs that the frustrated resurgence may yet become a reality, in the vigorous challenge mounted by 'natural (generative) grammar' against several of the tenets of Chomskyan linguistics.[7] To be sure, reliance upon the morpheme instead of the word is one of the bones of contention between orthodox transformationalists and their 'naturalist' challengers. In a recent article, Theo Vennemann takes transformationalists to task for resorting to the morpheme and proposes that "we consider giving up the view that the lexicon contains roots or stems (and perhaps affixes) rather than words, and adopting the hypothesis that the lexicon contains words, (and, of course, items larger than words, such as idiomatic phrases and sentences), but no items below the complexity of words, in particular, no roots, stems, or affixes" (1974:353).

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[4] "It is a fact that native speakers have an intuitive awareness of some such stable unit of the speech [as the word]" (Palmer 1972:132-33). "Diverse experience goes to show that native speakers have an intuitive awareness of word-like entities in their own language, whether written or not, to a greater extent than they have of other grammatical elements and structures set up by the linguist" (Robins 1964:193). "Word: a morpheme or combination of morphemes which native speakers regard as a minimal pronounceable meaningful unit" (Wardhaugh 1972:222).

[5] "No more convincing test could be desired than this, that the native Indian, quite unaccustomed to the concept of the written word, has nevertheless no serious difficulty in dictating a text to a linguistic student word by word" (Sapir 1921:35).

[6] The word is the unit of language which "allen Teilnehmern einer Sprachgemeinschaft, also nicht nur den Sprachwissenschaftler, erkennbar ist. Erkennbar in dem Sinn, dass auch der Analphabet imstande ist, in einer zusammenhängend gesprochenen Rede nachträglich diejenigen Lautfolgen voneinander zu trennen, z.B. durch Pausen, die der Sprachwissenschaftler unter die Kategorie der Wörter eingereiht hatt" (Seiler 1962:163).

[7] The *Papers of the Parasession on Natural Phonology* (Bruck, Fox and Lagaly 1974) have been written "to correct obvious faults in the theory of generative phonology epitomised by Chomsky and Halle's *Sound Pattern of English*", to a point where this trend "must be defined in this negative way" (Darden 1974:1), which prompted Schane's lament that "some of the 'natural phonology' proposals . . . actually constitute a return to pre-generative times" (1974:299).

This proposal, in which Vennemann sees a return to traditional practice, "seems revolutionary only against the exclusive background of the American Structuralist and Transformationalist preoccupation with the morpheme" (1974:354).[8] He praises scholars such as Rosetti (1947), Kramský (1969), and Pulgram (1970), who, "not submerged in the mainstream of American Structuralist and Transformational Linguistics, have continued to study properties of the word with the goal of defining the word by semantic and phonological criteria" (1974:354). If the word is to take again its rightful place in the edifice of grammar and in the economy of the lexicon, the questions raised structuralist and transformationalist critics about its nature, properties, and definition, will have to be answered. We might as well begin with the beginning, the question which has exacerbated challengers and frustrated champions to lead to the word's premature demise, the question of its definition.

In preparing the chapter he devoted to the definition of the word in his *Principles of Semantics*, Steven Ullmann (1959) counted more than two hundred of them. In trying to see our way clear through what Fingeir Hiorth has aptly characterized as this "jungle of definitions" (1958:16), we soon realized that the main obstacle lies not in the definitions themselves, but in their scope: they were simply not intended to define the same things. If scholars arguing about the word did not always realize that they didn't have the same kind of unit in mind, this was largely due to the fact that the question was generally approached as a struggle between two opposing forces, the champions of the word on one side of the barricade, its challengers on the other. This Manichaean outlook is partly responsible for perpetuating the notion that the dispute engages two monolithic forces: modern, progressive pioneers of a new grammatical order struggling valiantly against the stubborn rear-guard action of traditionalist, conservative defenders of the *statu quo*.

A closer look at the literature of the subject suggests a more complicated situation. To ignore in this short essay the numerous critics of a unit they find vague, imprecise, inconsistent, and incapable of satisfying the stringent standards imposed on units by the new linguistics,[9] a cursory examination of the defenders' position suggests that their views are far from reflecting a hard, one-sided consensus. In order to grasp the main thrust of their thinking, two fundamental distinctions are necessary, both of which cut across the traditionalists' ranks: one concerns the presence of the word in the languages of the world, and it entails its status as a universal unit; the other bears on the pervasiveness of the properties built into its definition, and it entails the status of the word as a universal concept.

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[8] Continued reliance upon the morpheme as advocated by Chomsky and Halle (1968:364-72) explains the difficulties encountered by transformational grammar in dealing with word boundaries. Cf. Sommerstein (1973:195-7), and Comrie (1971:447-461).

[9] Juilland and Roceric (1976).

1. The word as a unit

The first distinction is between scholars who take it for granted that all languages have words, and scholars who consider that, unlike the phoneme, the morpheme, or the sentence,[10] the word is inherent in the grammatical structure of certain languages only.

1.1. *Universal.* Most uncompromising among those who assume that all languages have words regardless of family, type, or group are the Dutch followers of de Groot and Reichling, who have repeatedly stated that "Every language has words and sentences. No language has other elements than words, sentences, and elements of words and sentences" (1949:136). Uhlenbeck agrees that "Every language has words" (1950:176), and so does Bergsland who considers that "Il est sans doute possible, dans chaque langue prise à part, de définir des termes du type dont on s'agit ici [mots]." (1949:493-4). We may add, among others, a Hiorth referring to languages which possess words as "presumably all languages" (1958:16), or a Bazell insisting that "The general conditions [for word status] are common to all languages" (1957:27).

It goes without saying that all those who characterize language with reference to the word and incorporate the concept in its definition belong in this group *ipso facto*: "Le mot reste . . . un de ces éléments sans lesquels une langue serait inconcevable", writes Doroszewski (1949:139), with the approval of Ammann for whom "Das Wort als Träger der Bedeutung ist aus der Sprache nicht auszudenken" (1925:29-30). For Akhmanova "The ultimate units of real communication are the minimal components of sentences — words" (1963:15), just as the word remains "the central element of the language system" according to Ullmann (1959:46).

1.2. *Particular.* Other scholars believe that words exist in certain languages only: "Not all languages contain words", states Milewski

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[10] "Some efforts have been made to salvage the notion of 'word' by trying to find linguistic criteria for identifying, say, the 'phonological word' or the 'morphological word'. The procedure may be useful for individual languages, but has no universal validity, as does the identification of phonemes, morphemes, syntactic constructions" (Hall Jr. 1964:133-34).

(1951:248), a view Greenberg summarizes but doesn't share when he writes that "There are probably languages to which the concept is inapplicable" (1957:27). For Mitchell, "Both words and paradigms can be set up (for some languages at least) on satisfactory formal grounds. Whether or not the word can be defined as a universal category, there is no doubt that it is a justifiable category in the grammatical analysis of Classical Greek" (1958:103).

The distinction is not always perceived as an alternative but as a spectrum ranging from "word languages" to "languages without words" through intermediate stages represented by "languages with weak word development" and "essentially wordless languages" (Milewski 1951:248, 253).

2. The word as a concept

The second distinction is between scholars who take it for granted that, universal or not, the word has properties which are essentially the same in the languages in which it occurs, and scholars who believe that the properties of the word as well as its definition vary from family to family and from type to type, if not from language to language:

> Mann kann versuchen, den Begriff des Wortes universell-generell, als für alle Sprachen gültig, zu definieren, oder sich damit begnügen, ihn für eine einzelne Sprache oder allenfalls einbestimmte Gruppe von Sprachen zu definieren. (Harweg 1964:21-2).

Newmark formulates a similar distinction in somewhat different terms:

> [After Bloomfield] attempts [to define the word] took two main directions. Studies like that of Trager and Smith, by elaborating definitions for specific languages, have avoided to make 'special assumptions' to take care of exceptional instances in other languages. Statements like those of Greenberg and Nida, on the other hand, concentrate on the problem of determining under what conditions we want to call something a word, what are the criteria on which our application of special assumptions depend. (1957:27).

2.1. *General.* Probably more numerous are the linguists who, from Noreen to Greenberg, have maintained that the properties of the word, the criteria for its definition, and the procedures for its segmentation are the same in all languages: "Der erste der beiden Versuche [den Begriff des Wortes universell-generell, als für alle Sprachen gültig, zu definieren], ist charakteristisch für die Definitionen der meisten Linguisten bis auf den heutigen Tag" (Harweg 1964:22).

Even among those who believe that the properties of the word vary from language to language, some ought to be classified in this group. To be sure, the continued use of the label 'word' suggests that although there are properties which distinguish the words of one language from those of another, there must be a background of shared properties to justify a common denomination. The first to insist on this basic point was the pioneering Noreen who noted long ago that "Übrigens ist es, gelinde, höchst unpraktisch, die Bedeutung von 'Wort' in eine Sprache so zu bestimmen, dass sie nicht von den in den anderen Sprachen vollständig unterscheidet." (1923:435). Closer to us, Householder broadened the scope of the same observation to cover all linguistic concepts, for "It makes no sense to define 'noun' [or 'word'] for a given language purely in terms of its morphology without indicating the 'universal' reason why you call it a 'noun' rather than an 'adverb' or 'briefcase'. Such universal reasons are not metaphysical fantasies but essential prerequisites for any discussion of languages" (1962:23).

2.1. *Specific.* But a substantial minority of those who reckon with words insist that the properties of the unit as well as its definition vary from language to language: "Poniatija slova voobšče ne suščestvuet" Ščerba (1945:175) states peremptorily, and Vendryes grudgingly concedes that "We cannot attempt any definition of the word which shall be applicable to all languages" (1925:89).[11] For Robins too, "There can be no general definition of the 'word' valid for each and every language" (1953:111),[12] a view shared by Carroll who maintains that "What is called word must be defined independently for each language that may be studied" (1953:236), and by Palmer who insists that "The word must be separately elicited for each speech community under observation" (1972:32). As for Trager, he rejoins testily that "The word can be defined in every language *I've* seen" (1956:34).

More detached is Martinet, who views the entire question as one of pure expedience: "Si, pour des raisons pratiques, cette unité intermédiaire entre le signe et le syntagme est retenu, elle sera définie en fonction de la langue étudiée, et on pourra la désigner par le terme 'mot' si on le désire" (1949:294). Robins is unimpressed by the fact that the word requires special treatment in every language, as he considers this to be the case for every linguistic concept: "The category [the word], like all linguistic categories, must be set up and justified for the language being analyzed" (1953:111). Less detached appears Harweg, who resigns himself to seeking a specific definition for the Late Sanskrit word only after he has satisfied himself that previous attempts at a general definition have failed: "Nach den bisherigen Erfahrungen, nach denen Versuche einer universell gültigen Definition zu keinen befriedigen Erfolg geführt haben, suchen wir nunmehr infolgenden lediglich eine einzelsprachige Definition" (1964:28).

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[11] Cf. also Vendryes (1953:81).

[12] Cf. also Robins (1959:209).

Here too we find compromise stands which consist in assigning to the word both general and specific properties: "The word has characteristics that are found in all languages, and others belonging to the word in some languages only", a compromise which de Groot and Reichling secure by distinguishing between the definition of the word (general) and its characteristics (specific), between grammatical properties (general) and phonological characteristics (specific): "The definition of the word is the same for all languages, but the phonological characteristics of the word may differ from language to language" (1949:232).

A subtler compromise is made by Bazell who distinguishes between general and derived criteria, the function of which can be reversed depending on whether one is trying to define the word in general or to establish its properties in particular languages: "The criteria suitable for general linguistics differ however from those suitable to the analysis of an individual system; criteria which are primary in the one case will be secondary in the other and vice versa. For general linguistics maximal generality is sought; for the analysis of an individual language maximal clarity" (1951:109). Thus, the same criterion may be primary or secondary depending on the intended use:

> Bloomfield's 'minimal free form', as has often been pointed out, is extremely vague; however it is applicable to every system. On the other hand, the criterion of 'accentual unity' is in many languages extremely clear, but does not apply to others at all. The latter may be described as *derived* criteria; they are chosen for their rough correspondence with the general criteria (and hence, from a panchronic standpoint are secondary), but once chosen become the primary criteria for the system in question. (1951:109-10).

The primacy of general criteria is methodological rather than logical, epistemologic rather than ontologic: "These criteria are primary in the sense that they are the first criteria used. They are not primary in the sense of being more important for the language in question. Once the secondary criteria, which are private to the individual language, have been discovered by application of the primary criteria, which are common to all languages, they then serve as the principal criteria for word-division" (1951:110).

A parallel but somewhat different distinction is made by Robins who assigns to phonological criteria the subsidiary role of resolving ambiguities and indeterminacies (Juilland 1961:20-23) left unresolved by grammatical criteria:

> To the word units of this sort correspond to a large extent the 'minimum free forms' or smallest potential utterances in a language, and in many, though by

> no means all, languages phonologically marked stretches delimited by accentual features of stress, pitch or the like, and sometimes by other prosodic marks. Since the word is by definition a grammatical abstraction, any such phonological criteria must remain logically secondary, even though in certain languages marginal cases may be decided one way or the other by reference to phonological criteria where the primary grammatical criteria are conflicting or anbiguous. (1959:120).

Rulon Wells comes closest to coordinating phonological and grammatical criteria, their function being to reinforce or supplement one another:

> In fact, the word is most solid as a unit in those languages whose phonemic and grammatical criteria reinforce each other. Bloomfield's definition of a word as a minimal free form involves both criteria: considered as a phoneme sequence, a word occurs in a phonemic zero environment; considered as a morpheme sequence, it occurs in morphemic zero-environment. (1957:197).[13]

But Wells' position is exceptional, as the subordinate character of phonological criteria has been emphasized again and again, from Wundt to Sapir and from Bloomfield to Bolinger. For most scholars the phonological characteristics of the word are only the outward manifestation of a reality whose nature is other than physical, i.e., abstract rather than concrete, psychological rather than physiological, grammatical rather than phonological: "Dass Wörter, die urpsrünglich mit gesonderten Accenten gesprochen werden, einen gemeinsamen Accent erhielten, ist offenbar nur eine äussere Wirkung der bereits eingetretenen Verbindung, nicht deren Ursache", wrote Wundt (1900:604), prefiguring more than three quarters of a century ago Sapir's 'mentalist' outlook: "Such features as accent, cadence, and the treatment of consonants and vowels within the body of a word are often useful aids in the external demarcation of the word, but must by no means be interpreted, as is sometimes done, as themselves responsible for its psychological existence. They at best but strengthen a feeling of unity that is already present on other grounds" (1921:36). Even for the 'mechanist' Bloomfield, "The word is not primarily a phonetic unit: we do not, by pauses or phonetic features mark off those segments of our speech which could be spoken alone. In various ways, however, different languages give phonetic recognition to the word unit; some, like French, very little, others, like English, very much" (1933:181).

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[13] In another context, however, Wells seems to acknowledge the subordinate character of phonological criteria: "If certain sequences belonging to a particular sequence-class are phonemically marked as separate words, then we may consider all members of this sequence-class to be words whether or not they are phonemically marked" (1957:197).

The best characterization of the subordinate role played by phonological factors is found in Bolinger's comment on Collinder's observation that vowel harmony stops at the end of the word: "we know that it stops at the end of the word because we already know where the word ends; such criteria are only confirmatory" (1963:131).

3. Understandings of the word

Considering that every scholar who reckons with words must implicitly or explicitly take a stand on both alternatives, there are four basic attitudes toward the word and its definition: (a) the word is universal, and so is its definition; (b) the word is universal, but its definition is not; (c) the word is not universal, but its definition is; and (d) the word is not universal, nor is its definition.

It is not always easy to fit the various scholars in the four niches of this framework, and risky to attempt situating them relative to the four cardinal positions. Seemingly unaware that the word may mean different things to different people, many supporters assume that all they have to do is endorse the unit through a general statement on its behalf; but as soon as they have to deal in specifics, their position is likely to oscillate from one pole to another depending on context.

3.1. *Universal unit, general definition.* The most uncompromising defenders of the traditional word are scholars who take it for granted that the unit is inherent in the grammatical structure of all languages, and that its properties and definition are always the same, regardless of family, type, or group.

Typical of this attitude is Uhlenbeck who, after stating that "Every language has words", proceeds to define them as "signs having a phonetic structure and capable of being used as a sentence in combination with an element of intonation" (1950:247), a definition supposed to hold in all languages.

Other scholars who gravitate around this position are Doroszewski (1949), de Groot (1949), Greenberg (1957), Meillet (1921), and Reichling (1959).

3.2. *Universal unit, specific definition.* A less uncompromising attitude among believers in the universality of the word is taken by linguists prepared to grant that its properties vary from language to language.

Suggestive of this position is the statement by de Groot and Reichling who, after insisting that "The definition of the word is the same for all languages", concede that "the phonological characteristics of the word may differ from language to language" (1949:232). Probably in the same category is Bazell's distinction between primary criteria "which are common to all languages" and secondary criteria which, once discovered, "serve as the principal criteria for word-division in particular languages" (1951:110).

Scholars who share roughly, albeit only occasionally, similar views are Nida (1967), Robins (1953 and 1959), Ščerba (1945), Togeby (1965), Trager (1956), and Vendryes (1925).

3.3. *Particular unit, general definition.* A reverse stand is taken by scholars who concede that there are languages without words but insist that the properties of these intermediate units are essentially the same in the different languages in which they occur: although the word can be recognized in the structure of certain languages only, "[man] versucht eine universell gültige Definition" (Harweg 1964:27).

Representative of this outlook is Milewski who, after granting that "Not all languages have words", proceeds to formulate a definition supposed to hold in all languages: "A word is a syntactic group distinguished within the clause by means of the same delimitating signals which are used for distinguishing other syntactic groups of the clause" (1951:249). But according to Bazell, "definitions intended for application to all languages, can never be complete. The supposition that they might gave rise to that most ridiculous of pseudo-problems, the question whether there are categories common to all languages" (1958:78).

Other scholars whose views cluster around this position are Bergsland (1959), Hiorth (1958), and, occasionally, Vendryes (1921).

3.4. *Particular unit, specific definition.* The most accommodating supporters of the word are linguists who not only admit that there are languages without words, but grant that the properties of the unit are such as to require "Definitionen die jeweils nur für eine einzelne Sprache gültig sein sollen" (Harweg 1964:27).

A typical representative of this flexible position is Palmer who stresses that in linguistics "The term word will have a narrower technical application than it has in everyday language" and insists that "The word must be separately elicited for each speech community under observation" (1972:32).

Other scholars who gravitate around the same pole are Harweg (1964), Lyons (1963), Martinet (1949 and 1961), Robins (1953), and all those who, like Pike (1967), prefer to a general definition an inventory of criteria from which specialists may select the most appropriate ones which they combine into specific definitions valid for the particular languages.

This framework of definitions should help avoid some of the confusions which abound in the literature of the subject, dispel certain misunderstandings which have marred many a debate over the definition of the word. Too often in the past linguists arguing about the word have failed to realize that they were not arguing about the same thing: some intended to say something about all languages, if not about language in general, while their opponents intended only a few, if not one alone; some were referring to a unit supposed to remain constant from family to family and from type to type, while their critics meant a unit they understood to vary from language to language. If we are to clarify some of the issues raised by what many still consider as "the central element of the language system" and make progress toward its definition, linguists ought to approach every statement about this most controversial among linguistic units by first ascertaining which of the basic understandings was intended.

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Universals of Language and Universals of Writing

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0. Introduction: perspectives on language and writing

After the publication of *Language* by Leonard Bloomfield, American linguistics emphasized that writing was not language, nor the object of linguistic study, but simply a reflection of language — that is, of speech. Few linguists today deny that spoken language is the main object of linguistic interest. Still, it is now widely acknowledged that writing is not simply a reflection of speech, but is in itself language and a fit object for linguistic research. Joseph Vachek's (1949) article was a milestone statement of this point of view, which was argued most vigorously from the Prague school. Granting that writing can begin as a direct representation of speech, Vachek believed that it quickly comes to symbolize meaning as directly as speech does; writing, then, is not entirely subsidiary to speech. He also observed that writing and speech form functionally different sets of registers of the same language; subsidiary or not, then, writing does have linguistic interest. More recently, Greenberg (1968:7-17) argued that speech and writing both share the definitional characteristics of language: they are multimodal, grammatical, productive, semantically universal, and dual (in having levels of meaning and nonmeaning).[1]

Some have taken this to mean that writing should be studied by linguists independently from the associated spoken language. While this viewpoint

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[1] As Greenberg (1968:16-17) noted, duality is limited to alphabetic and syllabic scripts.

was enthusiastically embraced by some, the contribution it has made to linguistics has been limited. Bazell (1956:46), discussing linguistic parallels for the grapheme, denied that writing has much importance for linguistic questions; he saw its usefulness more in historical, aesthetic, and applied research. Another study that quite insistently advocated the linguistic study of writing as language, in its own right and apart from speech, confessed that a 'graphic linguistics' has no linguistic value — it is simply interesting (McLaughlin 1963:43).

Studies of genuine linguistic interest never treat writing independently; rather, they emphasize the way units of speech are represented. Their purpose is generally to clarify ideas about spoken languages by applying linguistic procedures to the analysis of associated writing systems. Paper (1955) and Kyes (1967) sought to improve the understanding of Royal Achaemenid Elamite and Old Low Franconian, respectively, by investigating the written records of these languages. Sapir (1933) and King (1967) attempted to demonstrate that their respective theories of language description account for an improvised Paiute orthography and the history of High German spelling.

Writing, then, is indeed a distinct form of language; yet it has demonstrated linguistic significance only when studied in relation to spoken language. Put differently, any genuine linguistic significance in writing derives from the relation of script to speech.

1. Bases of a universalist approach to writing as language

1.0. *Previous work.* Particularly since 1961, typological studies have advanced our knowledge of universal properties of language independently of the researchers' commitments to any particular theory of description. Results of these studies have been used to explicate spoken languages preserved only in writing. Greenberg's (1962) analysis of the Coptic vowel system and Devine's (1974) study of Etruscan stops argue persuasively, on the basis of universal constraints on phonological inventories, that the dominant views on these topics were mistaken; each was able to reinterpret the data in more insightful and convincing ways.

1.1. *Theoretical bases.* This essay incorporates the study of writing itself into the universalist theory of language. Writing systems are subject to universal linguistic constraints; as language themselves, they should be subject to many of the same universal constraints as spoken language.[2] Even when linguistic constraints on writing are not the same as in speech, they are likely to be explicable by reference to spoken language since any linguistic constraints on writing are of genuine linguistic significance.

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[2] Knowledge of such constraints may aid in the reconstruction of specific dead languages (Section 3), and provides a basis for evaluating theories of language description with evidence from writing systems (Justeson, in press).

The units of a writing system cannot pattern exactly as every set of units in speech. Morphemic principles conflict with both autonomous and underlying phonemic principles in the representation of homonymous morphemes, in that either distinct morphemes are not distinguished or identical phonemes are not identified. Likewise, morphemic and autonomous phonemic principles conflict in the representation of different allomorphs of the same morpheme, in that either distinct phonemes are not distinguished or identical morphemes are not identified. In fact, it is unusual for writing to pattern consistently as any set of units in speech, even if they correspond predominantly to a single level of language structure. Hall (1963:56) observes that the exceptions to representation at one level of language structure often involve representation at another level; deviations not based on mixing of levels are also common.

If the representation of a language by a writing system were perfect, universal constraints on speech would be directly reflected in the writing system; these constraints would have little linguistic interest since they would be only trivially true. But since the total linguistic patterns of writing and speech cannot be the same, universal linguistic constraints on writing systems are not logically dependent on the constraints of speech. In particular, where the units of spoken and written language do not correspond one-to-one, or where corresponding units are not used identically, the linguistic constraints in writing do not directly reflect corresponding constraints in speech.[3] Accordingly, this paper assesses the potential of language universals in the study of writing by considering a special case: the conformity of the referents of the symbol inventory with the phonemic inventory of the language represented.

1.2. *Empirical bases of this study.* This investigation is based on a sample of fifty language-script pairs; only scripts with a substantial number of phonic signs are included since only phonological constraints are being investigated here.[4] Inclusion is also dependent in part on accessibility of sufficiently detailed reference material for both language and script. More important is the attempt to balance script types, so that alphabets do not receive much greater attention than syllabic and logosyllabic scripts.[5]

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[3] They are theoretically dependent, however, and do empirically reflect the corresponding constraints in speech, or the principles governing such constraints, as discussed in Section 4.

[4] Other kinds of linguistic constraints are discussed elsewhere (Justeson, in preparation).

[5] A script is classified as syllabic if and only if many signs represent multi-phonemic units, at least one phoneme in each unit being a syllabic nucleus. If a diacritic is used in this differentiation, and is regularly used with a single meaning, the script is classified as an alphabet (in Sanskrit, for example, each vowel is represented consistently by attaching its own diacritic to the 'syllabic' sign, so Sanskrit is classified as an alphabet). If a regular diacritic is not used in a substantial number of these cases, the script is classified as a syllabary. If single

Most important of all is selection of maximally independent cases. This independence entails three principles of selection. (1) Related scripts are included only if the spoken languages for which they were used are of different language families; cuneiform script, for example, was used in the writing of Hittite (Indo-European or Indo-Hittite), Old Akkadian (Semitic), and Hurrian (wider affiliation unknown). (2) Identical or related spoken languages are included only if they were written in scripts of different script families; for example, Mongolian languages were written in Classical Mongolian (Aramaic family), Cyrillic (Graeco-Roman family), and Jurchen (Chinese family) scripts. (3) Scripts like Cherokee and Loma are included because they were not simply borrowed from another group, but were invented independently (except for the stimulus of the idea of writing). This three-way selection is intended to maximize the range of variation in a sample of manageable size.[6]

In the statements to follow, unless otherwise noted, a phoneme is said to be distinctly represented if and only if, whenever the phoneme appears in the language, there appears in the written text some single sign which is immediately and exclusively identifiable with the phoneme without the aid of the context of the sign's occurrence.[7]

2. Results

2.1. *Unrestricted universals.* The following unrestricted universals were exceptionless in this sample.

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signs represent only consonants or only vowels — apart from rare exceptions such as the sign *ti* of Coptic — the script is classified as an alphabet. Thus, Egyptian is treated as alphabetic in organization since no sign distinguishes vowels and many indicate single consonants. For other purposes, a more subtle typology would be needed — presence or absence of logographs, for example, is important and some notice is made of this below. By and large, however, this crude alphabet-syllabary division captures the distinctions important in this report.

[6] The following alphabets (*A*) and syllabaries (*S*) were included in the sample: Amharic–*S*; Arabic (Egyptian)–*A*; Aramaic (Biblical)–*A*; Bamum–*S*; Bassa–*A*; Burmese–*A*; Cambodian–*S*; Cherokee–*S*; Coptic–*A*; Egyptian (Middle Kingdom)–*A*; Fula (Dita)–*A*; Fula (Adama Ba)–*A*; Georgian–*A*; Greek (Archaic Ionian)–*A*; Greek (Old Cypriote)–*S*; Hanunoo–*S*; Hausa (Arabic script)–*A*; Hausa (Roman script)–*A*; Hittite–*S*; Hungarian–*A*; Hurrian (Mitanni)–*S*; Japanese–*S*; Javanese–*A*; Jurchen–*S*; Korean–*A*; Kpelle–*S*; Loma–*S*; "Luvian" (Hieroglyphic Hittite)–*S*; Malay (Arabic script)–*A*; Malay (Redjang)–*S*; Maldivian–*A*; Mongolian (Classical)–*A*; Mongolian (Cyrillic)–*A*; Ojibwa (Severn)–*S*; Old Akkadian–*S*; Old English (runic)–*A*; Old Norse (Older Futhark)–*A*; Old Norse (Younger Futhark)–*A*; Old Persian–*S*; Pashto–*A*; Persian–*A*; Pahlavi–*A*; Sanskrit–*A*; Tagalog–*A*; Thai–*A*; Tibetan–*A*; Ugaritic–*A*; Vai–*S*; Vietnamese (Hanoi)–*A*; Wolof–*A*. The Older Futhark was added to the list, along with the Younger, in violation of (1) and (2), because of the interesting historical development of the futhark.

[7] With one exception to be noted ([14], Section 2.3.2.1), the conclusions to follow are still valid when 'distinct representation' is taken to include representation by digraphs, diacritics, or contextually distinguished signs. The statistical reliability of these results is generally poorer, since they are perforce based upon fewer failures of distinct representation.

[1] *All writing systems distinguishing any phonemes contain signs distinguishing some consonantal phonemes*, while not all contain signs distinguishing any vowel phonemes.

[2] *No writing system represents either long or geminate consonants*. This does not apply to representation of syllabic consonants, which are sometimes represented. As discussed in Section 2.3.2.2, representation of geminate consonants may only be a very strongly discouraged contingent possibility.

Some unrestricted statements hold only by overwhelming preponderance in the sample.

[3] *Few writing systems distinguish all their phonemes*. In this sample, the only exception was Sanskrit. Nonetheless,

[4] *most writing systems over-represent some of their phonemes,* either by having more than one symbol for the same phoneme, or by using otherwise phonemic signs to represent sub-phonemic sounds; Tagalog, for example, represents sequences of /Cy/ and /Cw/ by *Ciy* and *Cuw*, respectively.

2.2. *Over-representation of phonemes in script.* Some types of script more than others are subject to over-representation of phonemes. Given similar social contexts, over-representation is presumably discouraged less in scripts with few signs than in those with many (cf. Gelb 1963:80, 251; Householder 1958:382-383). Organizational principles also have an impact. For full representation of any one consonant, syllabaries require as many signs as there are separate vowels in the language (fewer with distributional restrictions); an alphabet requires but one sign. Thus, a whole series of signs may be involved in representing foreign phonemes occurring only in loan words, or in retaining homophonous signs borrowed from a language in which they were phonemically distinct. Since syllabaries tend to have more signs than alphabets, these excesses mean a proportionally greater burden in an already larger script. Should borrowed excesses nevertheless be retained in a syllabary, it is accordingly unlikely for a whole series of signs to be retained for a consonant that otherwise has adequate representation; so excess retentions will likely be sporadic. There are no organizational bases for differential retention of sporadic excesses; so size differences are of more importance than organizational differences in retention of excesses due to borrowing. Loan phonemes,[8] like native phonemes, are less likely to be sporadically represented; they should relate more to organizational differences.

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[8] 'Loan phoneme' in this paper covers two quite different situations, exemplified by Malay and Cambodian scripts. Malay writing preserves the Arabic spelling of Islamic religious words, although many of the letters are not otherwise used in Malay and do not represent native phonemes. Cambodian, in contrast, has some phonemes borrowed from French, which occur only in loan words and are not represented in the script.

Alphabets and syllabaries are also subject to different kinds of overrepresentation. Representations of allophones should be rarer in syllabaries than in alphabets. Much normal conditioning is embraced within the multiphoneme sequence spanned by a syllabic sign; a conditioning factor is unlikely to co-occur within the single-phoneme span of most alphabetic signs. Accordingly, conditioned variants of a phoneme may not be distinguishable by separate signs in a syllabary — since the conditioning may act within the span of that sign — while it probably can be so distinguished in an alphabet. For example, a back velar [q] may appear before /a/, /o/, and /u/, while a front velar [k] appears before /i/ and /e/. An alphabet may have two signs instead of one for the velar stop phoneme, each being used for one of these allophones. However, since the sequences **qi, *qe, *ka, *ko,* and **ku* do not occur in such a language, they cannot be distinguished by a syllabary from *ki*, *ke*, *qa*, *qo*, *qu*; that is, velar allophones cannot be distinguished in the syllabary.

Semivowels, when allophonic, are a partial exception to this. Many languages have consonantal allophones of /u/ and /i/, which pattern like consonants when preposed to vowels. Furthermore, there are spoken languages in which /w/ and /y/ are phonemic, but in which phonetically similar glides appear automatically in some vowel sequences. The *CV* articulation of the semivowel-vowel sequence may be accessible to scribes using a syllabary with canonical *CV* signs, so that syllabaries may represent nonphonemic instances of semivowels /w/ and /y/ distinctly. An alphabet dissects sound sequences into isolated constituent elements, and is thus not as apt to represent the nonprimary consonantal allophones of a vowel, nor, if the semivowels are phonemic, the phonetic glides between /i/ or /u/ and the following vowel. Accordingly, the representation of allophonic semivowels is subject to contrary pressures: usually allophones are more likely to be represented by alphabets, but in syllabaries the semivowels have unusual salience. Representation of allophonic semivowels should therefore associate less strongly with either alphabets or syllabaries.

Scripts are distinguished by both organization (alphabetic versus syllabic) and size (small versus large) in the statistical observations to follow. This is intended to demonstrate the correlation of specific types of overrepresentation at times mainly with size,[9] at times mainly with organizational principles of scripts. As is discussed in the notes, logosyllabic scripts differ in some respects from simple syllabic scripts in their over-representation of phonemes; were these differences due to chance alone, they would have only .050 probability of being as pronounced as in this sample. The seven logographic scripts — all but Egyptian are also syllabic — are therefore removed from consideration in Section 2.2. The results accord with the discussion above.[10]

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[9] Large scripts were defined, somewhat arbitrarily, as those having forty or more distinct, simple signs; digraphs such as Hungarian *sz* were not included in this count. The classification generally equates small scripts with alphabets, large ones with syllabaries; but Burmese, Egyptian, and Javanese are large alphabets, while Ojibwa and Redjang Malay are small syllabaries.

[5] *Alphabets and small scripts tend to over-represent phonemes proportionately more often than do syllabaries*[11] (Table I). Both size and organization seem to be significant in this statement; if either were an overriding factor, the small syllabaries and large alphabets should have had opposite classifications, while in fact they are classified identically. For both size and organization, the probability of the difference found here would be only .008 were it due to chance alone.[12]

[6] *Small scripts are more likely to have excess signs due to borrowing than are large scripts* (Table II). This is very likely a size distinction; its reflection in the organizational distinctions is presumably by association of small scripts with alphabets and large ones with syllabaries. The probability of getting differences of this magnitude between different sizes of script is .137 assuming there is no real difference; for the organizational differences the probability is much larger, .574. The probability of .137 is small

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[10] In syllabaries with canonically *CV* signs, final consonants of closed syllables such as *CVC* and nonfinal consonants of clusters must either not be represented at all or must be represented by the use of an excess vowel. Such unavoidable under- and over-representations, built into the systematics of the script, are not included in the following discussions; these logically inescapable deviations from phonemic representation, being trivially true, are of less interest than the remainder. None of the implications are affected by this exclusion except those in Sections 2.2 and 2.3.1, dealing with the extent of over- and under-representation based on size or organizational differences. In the present sample, only Hanunoo opted for suppression of the final consonant; the rest use an excess vowel.

[11] Strongly logographic scripts of this sample — Ancient Egyptian, Hittite, Hurrian, Japanese, Jurchen, Hieroglyphic 'Luvian', and Old Akkadian — all have over-representation of some phonemes. There are several sources for such over-representations. For example, in a borrowed logographic script, or one for a language that is changing, a word's traditional syllabic spelling is often retained irrespective of the existence of alternate spellings that are equally appropriate phonemically; the morphemic orientation may promote such retentions. Since the phonology of the donor language will differ from that of the recipient, some of the signs in such retentions may acquire the same phonemic value as other syllabic signs; the fossilized spellings will then serve to maintain these duplicates. Morpheme signs themselves may be used as duplicate signs for syllables to which they are phonetically similar. Furthermore, logographic scripts generally have hundreds of signs; a couple dozen extra signs are then of less relative importance than in a script with only 40 to 80 signs. Nonetheless, every one of these scripts also has some kind of under-representations — in most it is rampant. In this they accord with the other large scripts and syllabaries (see note 15).

[12] Probabilities of achieving the sample differences between alphabets and syllabaries are in all cases calculated by Fisher's exact method under the hypothesis that they are due to chance variations alone.

comfort but, as expected, the association is stronger for size differences than for organizational differences.

[7] *Alphabets are more likely to represent loan-word phonemes separately than are syllabaries*. In this sample, 10 of 32 (31.3%) of the alphabets have loan phonemes as a source of over-representation. Since it is not a feature of any syllabary — or any logographic script — representation of loan phonemes definitely associates with organizational principles of the script; the probability that the difference is due to chance is only .006. Ignoring loan phonemes, alphabets still over-represent more than syllabaries, but the difference would have .125 probability of occurring by chance on the hypothesis that there was no real difference between the two (Table III). Since this probability was only .008 when loan phonemes were counted as excesses, inclusion of loan phoneme representation is a cardinal distinction between alphabets and syllabaries.

Representation of loan phonemes does not seem to associate directly with inventory size, however; 8 of 32 small and 2 of 19 larger scripts include such representation (25.0% versus 10.5%). The difference between this may be due to chance, since it then would have .173 probability of occurrence. Ignoring loan phonemes representations leaves the difference in over-representation between large and small scripts virtually unchanged; the chance probability of such differences, after removing loan phonemes from consideration, is still only .005 on the hypothesis that no real difference exists.

[8] *Signs for /w/ and /y/ are over-represented in syllabaries and large scripts about as often as in alphabets and small scripts* (Table IV). The probabilities here are .320 for organizational and .257 for size differences.[13]

[9] *Alphabets and small scripts tend to distinguish allophones more often than do syllabaries and large scripts*[14] (Table V). The probability of these differences occurring by chance is .115 for both organizational and size distinctions; these probabilities are too high to clearly support the hypothesized predilection of alphabets over syllabaries for such over-representations. However, in the Cypriote and Redjang Malay syllabaries — the only syllabaries representing allophones — the sole source of allophonic representation is the excess use of *w* and *y*; these are not discouraged as much in large scripts and syllabaries as other allophones are. Removing cases of semivowel over-representation, the probability of the differences in allophone representation are .109 for organizational and .014 for size divisions of scripts.

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[13] The differences between simple syllabic scripts and logosyllabic scripts has only .077 probability of occurring by chance; only one (Jurchen) of five logosyllabic scripts did not have excess here.

[14] None of the logographic scripts represents them.

Thus, different kinds of excesses are associated with different kinds of scripts: allophones and borrowed excesses are more likely in small scripts than in large ones; allophones and loan phonemes are more likely in alphabets than in syllabaries; and semivowel over-representation is equally likely in any of these. Even aside from these structured excesses, phonemes are over-represented in writing; however,

[10] *apart from allophones, semivowels, borrowed excesses, and loan phonemes, alphabets and small scripts are about equally as likely to over-represent their phonemes as are syllabaries and large scripts* (Table VI). Here the probabilities are .688 and .312 for organizational and size differences, respectively.

No specific implicational relationships were found to link different sorts of over-representation of phonemes.

2.3. *Under-representation of phonemes in script*

2.3.1. *Association with script types.*[15] It is very rare for long vowels to receive separate signs from short vowels: Sanskrit distinguishes them consistently; Aramaic, Cambodian, Archaic Ionian Greek, Maldivian, and Loma distinguish them partially. This is 4 of 32 alphabets (12.5%) and 2 of 15 syllabaries (13.3%); the difference is not significant (p = .634). For diphthongs, written distinction is even rarer — in Sanskrit it is done consistently, in Loma sporadically, totalling 1 of 15 (6.7%) alphabets and 1 of 18 (12.5%) syllabaries; the difference here is likewise insignificant (p = .585). Removing diphthongs, long vowels, and long and geminate consonants from consideration (see [2]),

[11] *syllabaries and large scripts are more subject to under-representation of phonemes than are alphabets and small scripts* (Table VII). The chance probabilities of the differences are .132 for organizational and .108 for size differences. Given the distributions for alphabetic and small scripts, it would be extremely difficult to achieve any lower probabilities with this sample, even with moderately large differences in the actual probabilities of under-representation. The rather high probabilities reported therefore do not argue strongly either for or against [11].

The use of a script from an earlier stage of the language or from a totally different language sometimes results in deficient representation of phonemes.[16] Removing these from consideration as well, the same relationship holds (Table VIII); the associated probabilities in this case are .055 and .030. Eighteen of the 26 borrowed alphabets (69.2%) and 9 of the 11 borrowed syllabaries (81.8%) have some deficiencies due to borrowing; the difference is not significant (p = .361). The results for size differences are identical. Alphabets and syllabaries, then, are equally likely to tolerate some deficiencies in applying a script to their language, but for alphabets this is much more likely to be the sole source of deficiency once long vowels, diphthongs, and geminate consonants are removed from consideration.

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[15] In the results of this section, logographic scripts are not separated out from alphabetic and syllabic scripts, since logosyllabic and syllabic scripts have negligible difference in under-representation of phonemes. The probabilities of the differences between simple syllabic and logosyllabic scripts under the assumption of only random differences are: .297 for under-representation, generally and when borrowed deficiencies are excluded; .458 for presence in borrowed scripts of deficiencies due to borrowing; .365 for use of letter-grouping conventions to make up for deficiencies; and .833 for invention of new signs to make up for deficiencies in borrowed scripts.

[16] Old Norse, for example, acquired nasal vowels centuries after use of its runic script had

Deficiencies in script are often made up by use of combinations of letters with diacritics or with other letters to indicate the distinction that the inventory itself lacks (Table IX). Among scripts on which I have such information, 12 of 22 alphabets (54.5%) and 4 of 15 syllabaries (26.7%) that had some deficiencies made up for them, at least in part, in this way; the differences have a chance probability of .089. Diphthongs, long vowels, and geminate consonants were not considered in this count.

Likewise, of the scripts having deficiencies due to borrowing, some invented (or imported from other scripts) signs to supplement their inventories (Table X). For the Old Norse Younger Futhark and for Pahlavi, the missing signs, present in the donor script, were dropped in the process of transmission; for these daughter scripts, the option of supplementing the inventory is contradictory and does not apply. For the rest, 11 of 14 alphabets (78.6%) and 2 of 9 syllabaries (22.2%) invented new signs; the chance probability of this difference is .012. Had the Younger Futhark and Pahlavi scripts been included, the alphabetic ratio would drop to 68.8% with p = .033. Thus, whether by means of letter group conventions, diacritics, or introduction of additional signs:

[12] *Syllabaries are less likely than alphabets to make up for the deficiencies of their inventories.*

2.3.2. *Implications linking under-representation of different phonemes.* There are a number of exceptionless implicational relationships linking specific forms of under-representation. The general hypothesis of this paper is that such implicational relationships follow those of speech. In particular, they should conform to Greenberg's main explanatory principles: marking theory, typological clustering, and exclusion of discontinuity (Greenberg 1975:80-82, 90; 1968:152-153).

MARKING RELATIONSHIPS allow prediction of the typological class of one variable with respect to one other, as when the presence of voiced stops is contingent upon the presence of voiceless stops in the phoneme inventory. In TYPOLOGICAL CLUSTERING, knowledge of the typological classifica-

begun; Old Akkadian, which had phonemic voiced stops, was written in a script borrowed from Sumerian, which lacked them.

tion of one variable allows the prediction of the classification of a variety of other variables, either statistically or without exception. For instance, if languages are classified according to their dominant word-order sequence of subject, verb, and object, one can predict the presence of postpositions or prepositions, the position of possessives with respect to the noun, and of verb auxiliary with respect to the verb. The EXCLUSION OF DISCONTINUITY requires that the most dissimilar terms of a trichotomy will not be treated similarly in the typology unless the most similar terms of the trichotomy are. For example, in kinship terminology one never refers to father (+patrilineal, −collateral) and mother's brother (−patrilineal, +collateral) by the same term without using that term for father's brother (+patrilineal, +collateral).

Typological clustering does not show up very well in the implicational relationships mentioned in this paper. The main examples are the statistical associations noted already for the division of scripts by organization or size, and their relationship to different kinds of over- and under-representation. Compared to syllabaries, alphabets tend to have greater over-representation and less under-representation of phonemes, to make up deficiencies more often, and to have more representation of allophones and foreign phonemes. No phonological example of typological clustering has been published to date, so no specific prediction is available for application to the phonology of writing systems.

Marking principles, however, do suggest specific predictions since numerous phonological universals are based upon them. Whenever the presence of a phoneme of class *X* implies the presence of a phoneme of class *Y* in speech, it can be predicted that in writing systems, whenever a phoneme of class *X* is represented in script, phonemes of class *Y* are also represented. The syncretism of members of the marked category suggests predictions that if phonemes of class *X* are distinguished from each other in script, phonemes of class *Y* are also distinguished from each other. Likewise, by exclusion of discontinuity one predicts that the most dissimilar two in a trio of phonemes are not both represented distinctly unless the third phoneme is, and that the most dissimilar two in a trio of phonemes are not both under-represented unless the third phoneme is.

All statements below concerning the representation of any phoneme or class of phonemes entail the assumption that they exist as phonemes in the language.

2.3.2.1. *Vowel representation.* The diphthongs may be viewed as long vowels with mixed qualities (+long, +mixed), long vowels as long with pure quality (+long, −mixed), and short vowels as short and pure (−long, −mixed). By the exclusion of discontinuity, if long vowels have distinct representation, either short vowels or diphthongs will also have distinct representation; and if long vowels are without distinct representation, either short vowels or diphthongs are also without it. This is true without exception in this sample. However, marking relations also apply here, since long vowels and diphthongs are more marked than short vowels. The additional constraints result in an implicational chain in which

[13] *no long vowels are represented distinctly unless some short vowels are*[17] (Table XI); and

[14] *no diphthongs are represented distinctly unless some long vowels are*[18] (Table XII). In the tables, a script is entered as representing long vowels or diphthongs if any long vowel or diphthong is represented distinctly. Thus, Maldivian represents /o:/ by a sign which was historically a sequence of two signs for /o/; the remaining long vowels are still represented by such sequences. Sanskrit is the only script that includes distinct representation of all short, long, and diphthongal vowels.

When diacritics are admitted, the same relationship holds. When digraphs or longer letter-sequences are admitted, [14] is reversed to

[14a] *No long vowels are represented distinctly by letter sequences unless some diphthongs are*. In Old Norse, for example, long vowels and short vowels were not distinguished by separate signs, by diacritics, or by doubling of the vowel; diphthongs were represented by a sequence of vowel letters. If a diphthong /a^w/ and a long vowel /a:/ are to be separated into vowel sequences *aw* and *aa*, the *aw* is more accessible: the sequence of vowels is crucial to the representation of the mixed quality of a diphthong, while it has no closer relation to the pure quality of a long vowel than does the use of a single vowel letter.

Several implications in speech involve nasal vowels (Ferguson 1965); correlates in writing are:

[15] *no nasal vowel is represented unless some nasal consonants are represented*;

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[17] The identification of some writing systems as representing only short vowels by distinct signs might be thought spurious, since with no distinction neither member of the long/short pair might be represented. However, an overt mark of length is sometimes added to the vowel sign used for the short vowel, indicating that the basic sign does represent the short vowel rather than the long. Three of the fifteen scripts represent short vowels but not diphthongs by separate signs, while lacking long pure vowels; they are classed for convenience with other exemplars of statement [13].

[18] Pashto, an essentially consonantal alphabet, does not represent any pure vowels distinctly, though it does have distinct signs for final /ay/ and /əy/; these, however, are only used to represent the masculine /-ay/ and feminine /-əy/ grammatical suffixes. This morphemic representation is not considered in the data on phonological representation; but had it been a phonological distinction, it would have contradicted statement [14]. Outside the sample, Linear B (Mycenaean Greek) is exceptional; for a discussion of this case and its theoretical implications see Justeson and Stephens (forthcoming).

Cambodian, curiously, represents some nonphonemic diphthongs by simple signs, but does not so represent its phonemic diphthongs; this may be due to a closer phonetic resemblance of the referents of signs in the source alphabet to the nonphonemic than to the phonemic Cambodian diphthongs.

[16] *no nasal vowel is represented unless some oral vowels are represented* (Table XIII). The extent of representation of nasal vowels in single signs is rather low in each of the relevant scripts. In Old Norse, /ā̃/ alone is represented.[19] Cherokee has one nasal vowel phoneme which is adequately represented but its quality also differs from all the oral qualities. Loma has several signs distinguishing nasal from oral vowels, but the syllabary does not make full provision for this; and Vai supposedly also has a very few such signs. Of these scripts, only Old Norse ever fails to represent nasal consonants; and even that failure is much more limited than the failure to represent nasal vowels, since distinct signs for all nasal consonants exist and all are normally used. Nasal vowels generally are indicated by the corresponding oral vowel followed by a nasal consonant, even when, as in Bassa, the script was invented after nasal vowels already existed. Thus, the oral vowels are not distinguished by a single sign either; if the requirement for context-free identifiability is relaxed, however, the oral vowels are represented by single signs, the nasals by digraphs, as listed in Table XIII.

[17] *The proportion of nasal vowels that are distinctly represented never exceeds the proportion of oral vowels that are distinctly represented.* This is the counterpart to the universal that the number of oral vowels never exceeds the number of nasal vowels in speech, an example of the syncretism of the members of the marked category. The sources consulted were not detailed enough, in any of these cases, to determine whether the proportion of oral vowels distinguished by a single sign exceeds the proportion of nasal vowels, but this is doubtful. Relaxing the requirement of context-free identifiability, however, Cherokee represents all nasal and oral vowels distinctly; the other languages represent a smaller proportion of nasals.

Tone, as a syllabic feature, should also link to vowel representation.[20] Indeed, the Arabic script of Hausa, which does not distinguish vowels, also fails to represent tone in any way; this may reflect an implication that

[18] *if no vowel quality distinction is represented, no tone distinction is represented.* With only one tonal language written in a script lacking vowels, this is no more than a suggestion; however, it does go along with another observation. Tone is most commonly indicated by diacritics,[21] or occasionally by special consonants; in this sample

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[19] It appears because the original name for /ā̃/, **ansur*, shifted to *ās*, while the shift of **yāra* to *ar* left the alphabet with a distinct sign for /a/ as well.

[20] In this sample, tone is not represented if vowel length or vowel nasality is represented; while this may be an economy of vowel representation, it seems more likely fortuitous.

[21] Tone, nasality, and length of vowels are often written by adding overt diacritics or specific letters — stops, *n*, or repeated vowels, for example — so that they are there treated as

[18a] *tonal diacritics are always attached to letters representing syllabic nuclei if they are attached to any other letters.*[22]

As mentioned in note 21, Burmese generally represents its unmarked, level tone by a simple sign without a diacritic for tone, though a few such signs represent other tones instead. Vietnamese consistently represents level tone by a simple vowel sign, devoid of diacritics, while all their tones are represented by diacritics. In Bassa and Thai, all tones are represented by diacritics, in Tibetan none. Neither Hausa script represents tone at all. While the level tone does not always occur and is not always the unmarked tone of a language, it seems plausible that

[19] *if diacritics are used to indicate tones, the unmarked tone is among those indicated by a vowel sign lacking a diacritic.* Again, with only Burmese and Vietnamese as positive evidence, little confidence can be put in this, but it does seem to typify the orthographies of languages outside the sample, at least in linguistic practice; Yucatec is such an instance.

Finally, there are some constraints on specific vowels represented. The near universality of the three vowels, /a/, /i/, and /u/ prompts a proposal that

[20] *if a script has independent units to represent vowels, separate signs distinguish the phonemes /a/, /i/, and /u/ from each other.* This statement also seems to be true of scripts, mainly of Semitic derivation, in which consonantal signs are commonly used to indicate vowels. Statement [20] can be revised accordingly to the more comprehensive statement

[20a] *if a script has independent signs that can be used to represent vowels – even if nondistinctly – then /a/, /i/, and /u/ can be represented with different signs.*

This covers the cases of Egyptian Arabic, ancient Egyptian, Pashto, Malay, and Persian; I have no reliable information on this aspect of the use of Arabic Hausa. However, in the case of Egyptian Arabic, while [20a] is valid, the sign *y* can also be used for both /a/ and /i/. Since there is another sign for /a/, the three vowels can be written with different signs but needn't always be so written.

Even excluding /a/, /i/, and /u/,

[21] *Vowels at the periphery of the phonological space (such as /a/, /e/, /i/, /o/,*

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prosodic phonemes. Two scripts in the sample do have separate signs that distinguish vowels of differing tonality, at least to an extent. Burmese, for example, normally uses diacritics to indicate tones other than the unmarked, level tone; some signs, however, lack any diacritics but still distinctly mark other tones. Tibetan represents its tonal distinctions more thoroughly, even though it is by no means complete.

[22] In the Loma orthography employed by Sadler, tone markers attach to the consonant preceding nasal vowels, since the tilde marking vowel nasality occupies the same typographical space.

and /u/) will be represented distinctly if vowels from within it (such as /ə/) are represented distinctly (Table XIV).

2.3.2.2. *Consonant representation.* [1] and [2] state that some consonants are always distinguished, but geminate consonants never, by single signs in this sample. Admitting the use of multiple letters, however, [2] is no longer valid since many (though not all) scripts will double a consonant sign to represent length or gemination. The implication parallels that for long and short vowels:

[22] *if any geminate consonants are represented, some simple consonants are represented in a script.* This statement is also valid when representation is in single units, but trivially since geminate consonants are never represented by single units in this sample. If the parallel with vowels is extended to sequences of mixed consonants, analogously with the mixed long vowels, or diphthongs, the following implication is valid for representation by multiple units:

[23] *if geminate consonants are represented, consonant clusters are also represented.* This implication is valid for single-unit representation as well; in the case of vowels and diphthongs, the implication for representation by multiple signs was reversed from representation by single signs. That this is backward for single-unit representation is no doubt due to the dubious phonemic status of consonantal gemination in most languages; consonant clusters, of course, are multiphonemic as well.

[24] *Syllabaries tend to under-represent liquids more often than do alphabets* (Table XV).

[25] *Alphabets and syllabaries are about equally likely to under-represent at least some glides* (Table XVI). 'Glides' are here taken to be the set /ʔ/, /h/, /w/, and /y/.

There are relations between glide and liquid representation. The results of Table XVII can be phrased in several ways. For alphabets, the representations of liquids and glides do not depend on each other: it is about equally likely that only one of these classes is represented as that both are either represented or not; there is also a good probability that at least one or the other is not represented. It is about equally likely in syllabaries that one of the classes is not represented; but here it is not very likely that exactly one of the two will be represented. If glides are represented in syllabaries, liquids are also probably represented; if glides are not, liquids are not either. On the whole, it is uncommon for liquids to be under-represented when glides are not under-represented.

Regardless of script type,

[26] *phonemic /w/ and /y/ are fully represented with about equal frequency in writing* (Table XVIII). The probabilities of differences between /w/ and /y/ arising by chance are .407 for alphabets and .642 for syllabaries.

The main reason for this equality is apparent in Table XX, since /w/ and /y/ are there shown to be both represented, or both deficient, in 32 of 36 cases (88.9%) when both exist in a language. Alphabets and syllabaries represent them about equally often, roughly 60% of the time (p = .485 for /w/ and .590 for /y/).

[27] *Alphabets represent /h/ more often than they do /y/ (p = .172) or /w/ (p = .071); syllabaries represent /h/ less often than they do /y/ (p = .136) or /w/ (p = .136).*

[28] *Glottal stops are rarely represented by either alphabets or syllabaries.*

There are also exceptionless implicational relations among the glides.

[29] *If /ʔ/ is represented, every other glide will be represented* (Table XIX). Only two languages represent /ʔ/; in both, /h/, /w/, and /y/ are all represented. Since 14 of the 26 scripts that have these three phonemes representing all of them, there is a .290 probability of getting this result by chance alone. However, if the confusion of a consonant with a vowel is disregarded in enumerating under-representations — so that the use of *y* for both /i/ and /y/ is not treated as under-representation — the Arabic-derived scripts also represent /ʔ/. Including these in the sample, the implication still has no exceptions, and the number of languages representing /ʔ/ has been raised to five. Persian represents both /h/ and /w/; /y/ does not exist. The other four have and distinctly represent /h/, /w/, and /y/. Of the two languages in the sample having /h/ and /w/ but not /y/, Persian represents both and Archaic Ionian Greek represents only /w/ distinctly. The probability of getting [27] by chance in this case is $1/2\ (16/26)^4$, or .072. It is most likely that the result is not accidental.

No exceptionless implicational relations exist between any two of the remaining glides: the representation of no one of them implies the representation of any other (Table XX). If an implicational relationship holds between the three together, it should accord with the exclusion of discontinuity. There are three logically possible ways to arrange three terms so that the extreme points of the triple are least similar: here, as /w/, /h/, /y/; /h/, /y/, /w/; and /h/, /w/, /y/. Phonetically, the first makes no sense since the glottal /h/ must be at one extreme; /y/ is a palatal. If /w/ is defined as a labial, the second alternative is valid. This leads to a prediction that

[30] representation of either /w/ or /h/ or both is deficient if representation of /y/ is deficient; representation of /w/ or /h/ or both is distinct if representation of /y/ is distinct (Table XXI). This implication is not valid for this sample, since the number of exceptions would occur by chance with probability .393.[23] /w/ can also be defined as a velar phoneme, in which case the implication predicted would be

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[23] Burmese is an exception to the first of this pair of implications; Ojibwa and Thai to the second. Only twelve cases are relevant in determining the existence of a restriction, since +A, +B, and −A, −B are both consistent with both A => B and B => A.

[30a] *either /h/ or /y/ or both are distinctly represented if /w/ is; either /h/ or /y/ or both are not distinctly represented if /w/ is not.*[24] There are no exceptions to this. The probability of getting this result by chance is .008; the probability that either [30] or [30a] would be true is .015.[25]

Among the liquids, certain types normally designated as simple /l/ and /r/ are fairly widespread. Other types, which may be described as nasalized, voiceless, aspirated, palatalized, etc., may be thought of as marked liquids; they are much more rarely encountered, and generally (though not always) in languages having the unmarked liquids. In scripts of this sample

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[24] Pahlavi exemplifies [30a] differently in different periods, giving a neat developmental picture. In the inscriptions, /h/ is distinctly represented, while /w/ and /y/ are not. By the Book Pahlavi period, /h/ had also lost the distinctness of its representation. Likewise, Old Norse originally represented all three; with the Younger Futhark, however, only /h/ was maintained distinctly.

[25] There is good reason to favor the velar definition of /w/ over the labial definition; accordingly, [30a] is better motivated than is [30]. In languages having only one high back vowel, /u/, the rounding of the phoneme is almost always a predictable phonetic feature not present in the feature definition of the phoneme; since /w/ normally has the same feature specification as /u/ — apart from a trait indicating its consonantal character — it should also normally be + BACK by definition with its rounding predictable.

It is fairly common for /w/ to be strengthened to include a velar stop or fricative articulation. It often strengthens to [g], [gw], or [γw], syllable-initially or under emphasis. /k^{w}/ and /g^{w}/ often arise spontaneously from /w/ without segmental conditioning; this is the source of Kekchi Mayan /k^{w}/, for example. The reverse processes also have numerous attestations. (This argument for the essential velarity of /w/ was noted long ago by Graff (1839:12): "Wie nahe der *W*-Laut dem gutturalen Laut steht, ergiebt sich aus dem Wechsel beider".) It is rare, in contrast, for /w/ to strengthen to /p^{w}/ or /b^{w}/. There are many common examples of both velar and labial fricative of allophones of /w/, but velar stop allophones (as in Yaqui) appear to be more common than labial stop allophones. In borrowing, [w] often strengthens to velars; throughout the history of Romance languages, for example, /gw/ customarily renders the native [w] of loan words. Some of the most powerful evidence comes from the very frequent homorganic adaptation of nasal consonants to following adjacent consonants: quite often, as in Mayan languages, nasals before /w/ go to [ŋ]; in few languages is [m] homorganic with /w/. As in Loma (Sadler 1951:262), nasality of vowels following /w/ may have more similar quality to nasality of vowels following velar consonants than to nasality following labials. In contrast, phonological situations linking labial consonants with /w/ seem to link velars with /w/ as well. I am indebted to James Fox and to Laurence Stephens for bringing most of these points to my attention.

Nonetheless, it might be argued that both the labial and velar definitions should be applied simultaneously for the purposes of writing systems, so that both [30] and [30a] should be valid. The two together are equivalent to the implication

[30b] *either /w/ and /y/ are both distinctly represented, or both are under-represented in script.* Out of twelve relevant scripts (see note 12), the observed occurrences of three scripts in the four disfavored and nine in the two favored cells would have only .004 probability assuming all six options were equally likely. This is in part due to the validity of [30a]; however, even removing the pair disfavored by [30a] from consideration, the probability is still only .073 that the results should be in such accord with [30b]. In the discussion of [26] it was also noted that this tendency is true in 32 of the 36 scripts whose spoken languages have both /y/ and /w/. If only the four possibilities inconsistent with [30b] are considered, the exceptionless validation of [30a] has probability .125.

[31] *no marked liquid is represented in script unless some unmarked liquids in the language are represented in script*[26] (Table XXII).

One observation not anticipated is

[32] *if /l/ is not represented in a script, neither is /r/*[27] (Table XXIII). This implication has probability .063 of resulting by chance, tempting one to propose that /l/ is the unmarked and /r/ the marked member of the opposition of /l/ to /r/; a fair amount of evidence does support this proposal.[28]

In general, the presence of glottalized consonants indicates the presence of a glottal stop in a language; this is due to the historic source of glottalized consonants in the conjunction of a consonant with a glottal stop. Prenasalized stops, likewise, occur only in languages with primary nasal stops, presumably for the same reason.

[26] The sample is not sufficient to decide if the quantifier 'some' in this statement should be changed to 'all'.

[27] Again, Pahlavi writing demonstrates this differently in different periods. In the Psalter, /r/ was not represented distinctly from /w/, /d/, or /ʕ/; /l/ did have distinct representation. Later, in the Book Pahlavi period, /l/ was no longer distinct since /r/ had come to be written with the same sign. Then /l/ was again distinguished, through double writing of the letter *l* when /l/ was intended — by a digraph, or with one of the *l*'s used as a diacritic — while it was left single for /r/. However, /r/ was not distinctly represented since it was occasionally still written with the form that was ambiguous for /r/, /w/, /d/, and /ʕ/.

It should be pointed out that when there are deficiencies among the liquids, there are usually signs that confuse /l/ and /r/. In Hanunoo, for example, one sign is used for both /la/ and /ra/; otherwise, /l/ and /r/ are distinguished. The initial example in Pahlavi was exceptional, largely because the changes in the script were due to convergence of similar letter shapes rather than to any phonological motivation.

The validity of a marked counterpart to [32] — [32a] */l*/ will be distinctly represented if /r*/ is* — cannot be determined from this sample; it is not controverted, however.

[28] If /l/ is unmarked, one might expect that /l/ is always present in speech if /r/ is, but this is not the case; Ancient Egyptian had /r/ without /l/, for example. While not exceptionless, however, this hierarchy does appear valid. The prediction was tested statistically with the 203-language sample of the Phonology Archive of Stanford's Language Universals Project (Table XXIII); Marilyn Vihman assisted in the interpretation of the records. As expected, more languages had /l/ without /r/ (49) than /r/ without /l/ (33); a difference this large would have only .049 probability if /l/ were not marked with respect to /r/. (In four cases of /r/ without /l/, it was impossible to determine from the Archive's sources whether the primary allophone of /r/ was simple or marked; if any are marked, the differences between lone /l/ and lone /r/ are greater, and the chance probability less; if all four are marked, the probability falls to .015.) In children's acquisition of language there is further evidence that /l/ is less marked than /r/. Jakobson (1941) demonstrated that children tend to acquire the less marked phonemes of their language earlier than the more marked. In languages having both /l/ and /r/, then, /l/ should be acquired before /r/. This is indeed the consistent result of all studies of the acquisition of liquids; /l/ is in fact initially used for adult /r/ (Stoel 1974:30). Similarly, Ferguson (1964:105) found that in adults' baby talk of any language, /r/ is replaced by apical stops or liquids — /l/ among them; he notes no such replacement of /l/.

The data on consonant clusters including liquids also support this marking hierarchy. Consonant clusters are marked sequences; since the marked member of an opposition is often unmarked in marked contexts, it is reasonable that in clusters of stops followed by liquids, /r/ is more likely to appear when the contrast is neutralized. It is also in such clusters that /r/ first appears in children's speech (Stoel 1974:19).

We would expect from these results that in writing, if any glottalized consonants are represented, the glottal stop is also represented. There are two kinds of glottalized consonants: ejective and implosive. For the ejectives, the expected implication is valid in the sample (Table XXIV). However, in each case either both are represented or both are deficient, so that there are no cases that could exclude either this implication or the reverse.[29] For the implosives, all five scripts are inconsistent with the expected implication, and consistent with the reverse. Empirically, then, we have the anomolous observation,

[33] if the glottal stop is represented, some glottalized consonants are represented. Only one language in 10 represents no glottalized consonant distinctly and 2 in 14 represent /ʔ/, so that [33] could have probability .986 of occurring were all differences due to chance.

For the nasals, the sample confirms the prediction that

[34] *nasalized consonants are not represented distinctly unless all consonants are represented distinctly*. Bamum script does not distinguish final nasals from certain nonnasal stops; and the Bassa alphabet uses the same sign to represent both /m/ and /ɓ/. In neither of these are any prenasalized stops distinguished. Fula (Dita) represents both nasals and prenasalized stops distinctly; Arabic Hausa represents its nasals and /r̃/ distinctly.

Aspirated, glottalized, retroflexed, and nasalized stops are more marked than voiced stops. This leads to the prediction, exceptionless in this sample, that

[35] *all voiced stops are represented distinctly if all phonemes of any especially marked class of stops are represented*, e.g., aspirated, nasalized, glottalized, retroflexed (Table XXV). The syncretism of the marked category also leads to the prediction

[35a] *all voiced stops are distinguished from each other in script if all phonemes within the aspirated, nasalized, glottalized, retroflexed, or other especially marked class of stops are distinguished from each other*. This is also without exception in the sample.

Voiced stops, on the other hand, are more marked than simple unvoiced stops, leading to the correct predictions that

[36] *voiceless stops have distinct representation if voiced stops do* (Table XXVI); and

[36a] *voiceless stops are distinguished from each other if voiced stops are distinguished from each other*. Only Pahlavi represents all its voiceless stops without representing all its voiced stops distinctly. The other scripts either lack both, or if they represent either, they represent both, inasmuch as the two types are normally confused with each other, if at all.

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[29] Outside the sample there are exceptions, such as the colonial orthographies of Yucatec and other Mayan languages.

[37] *Nasal consonants are often omitted before stops.* There is insufficient information available to me to test how many scripts do not ever lose their nasals. However, at least six of the syllabaries and four of the alphabets do lose them in this position. This recalls the general failure to represent prenasalized consonants. It is possible that there is a link here with the representation of nasal vowels; in the sample, however, only Vai and Tibetan have both nasal vowels and prenasalized stops. Neither represents prenasalized stops; Vai represents nasal vowels to a very limited extent, and Tibetan does not represent them at all. If there is an implication here it is that

[38] prenasalized stops are not represented unless nasal vowels are represented. Since sporadic representation of nasal vowels occurred in 3 of 6 cases and prenasalized stops in only 2 of 9, there is a .346 probability of getting this implication, and only .068 probability of getting the reverse implication; the chance of getting an inconclusive result, or one ruling out implications, is .586.

3. Applications

3.1. *Decipherment of ancient scripts.* The best-attested of the above observations can be used to assist in the solution of outstanding problems in the decipherment of ancient writing. Two are applied here: one is statistical, the other exceptionless in the present sample.

(1) Packard (1974:103; cf. Ventris and Chadwick 1956:39) suggests that Linear A sign L32 has the same value, *ya*, as a formally identical sign in Linear B; it is among the best confirmed values in his statistical study of the Linear A signs. Unlike the Linear B uses, the evidence was that the sign is used almost exclusively for phonemic /y/, and not for purely phonetic glides between vowels. Nonetheless, there are clear orthographic alternations between this purported *ya* and the even better established *a* (Packard 1974:79, 95, 194); Packard seems to find this alternation incompatible with the assumption that *y*- was always phonemic.

It was noted in the discussion of [26] that about 40% of the syllabaries can be expected to under-represent phonemic /y/; in most cases, as here, one form of under-representation of /y/ is failure to represent it in all cases although a sign was available for use. The alternations of the signs must be accounted for by any valid hypothesis; the accord of the proposed values with independently derived universal tendencies therefore tends more to support than to weaken the identification of L32 with phonemic /ya/. By extension, it supports the hypothesis of a transferance of values along with the signs when the Linear A script was adapted to Greek in Linear B.

(2) The extent of syllabic writing in Mayan hieroglyphics has been a matter of sharp debate. Kelley (1962:284-285) argued that syllabic writing

was demonstrated by the use of a purported *ka-se-an* spelling of a month name in an area in which the word was probably *kasew*, and a spelling *se-ka* in an area in which the name was *sek*. The *an* sign, on the assumption it is syllabic, has been shown on independent grounds to have the reading *wa* (Lounsbury 1973:138; Fox & Justeson 1976), so that the Kelley reading can be improved to *ka-se-wa* for *kasew*.

Thompson (1963:133-134) noted that there were examples in the *kasew* area where the spelling, under the syllabic assumption, was *ka-se*. Since there was a sign known to have the reading *u*, at least when used as a morpheme, Thompson believed the omission was unaccountable in a syllabic system. He therefore suggested that all three signs were ideographic, and that the interchange in order of reading was reasonable in an ideographic, but not in a phonetic system. Thompson viewed the writing system as having no phonetic signs, apart from the use of the same sign for some homophonous morphemes.

As with /y/ in Linear A, the omission of /w/ in script is perfectly reasonable to expect, having about a 40% likelihood in the sample. However, we also know from [30a] that, if /w/ sometimes is not represented, either /h/ or /y/ or both must occasionally be ignored in script as well. This must be demonstrated if the syllabic hypothesis is to be sustained. In fact, logographs for morphemes of phonemic shape *CVh* are often used with the corresponding reading *CV*; conversely, syllabic signs with proposed *CV* readings are used on occasion for *CVh* morphemes. One example, *bah* 'rodent', is used as the syllable *ba* in a number of places, as demonstrated by its alternation in the same sign groups and in the same contexts with a sign for which the syllabic reading *ba* had been independently proposed (Kelley 1962:305-307; Prouskouriakoff 1968:250-251; Fox and Justeson 1976). The syllabic sign *wa*, on the other hand, is used in manuscripts as *wah* in the good augury *oš ok wah* 'three handfuls of corn' (Fox and Justeson 1976). There are other examples of this alternation. Additionally, there are likely examples in which syllabic signs *CV* are used for *CVy*, and conversely: *ka* is sometimes replaced by *kay* 'fish'; *ma* seems to have been used to represent *may* 'twenty; eight thousand' (Justeson, in preparation).

Proposed syllabic readings of Mayan signs are consistent with implication [30a]; this argues for the correctness of Kelley's interpretation of the month *kasew/sek*, and for the view that syllabic signs do form a component of the script.

3.2. *Analysis of dead languages.* The evidentiary value of writing systems for the study of poorly known, dead languages is enhanced by these observations. In Paper's (1955) analysis of Royal Achaemenid Elamite, for example, /h/ and /w/ do not exist. My analysis (Justeson, n.d.) would give it /w/ and /h/, and attribute the alternations noted by Paper to orthographic conventions that were rather widespread in the ancient Near East's cuneiform scripts. Following this analysis, Elamite represents /y/ distinctly, but not /w/ or /h/; this is consistent with implication [30a].

4. Universals of language and universals of writing

The study of writing is also important as one element of an emerging theory of language universals. By and large, a constraint on co-occurrence of phonemes in speech also corresponds directly to a constraint on the representation of phonemes in scripts of any language.

The most immediate explanations for these constraints must be different in the two cases, however. Using Greenberg's (1966) 'state-process' model, many regularities in language may be deduced from the potential interactions of other synchronic and diachronic regularities. Thus, nasal vowels never exist in speech except when oral vowels exist because nasal vowels historically arise by oral vowels' assimilation of contiguous consonantal nasality. This cannot tell us why speakers of a language like Loma, inventing a writing system of their own after having received only the idea of writing, generally do not distinguish the nasal vowels from the oral vowels, nor why this never happens except when oral vowels have distinct representation. Furthermore, one prediction of the standard marking hierarchy was contradicted: in speech the presence of implosive consonants implies the presence of a glottal stop; in writing these are independent.

The similarities, however, heavily outweigh the differences. Doubting that the similarities are mere coincidence, and recognizing that the diachronic origin theories which directly explain many universals in speech cannot account for this parallelism, some higher-order explanation must be provided.

The use of writing is an obvious case of adaptation of a language to another mode of communication; theories of language adaptivity should be pertinent to the explanation of this special case of adaptation. In writing, language itself is being processed for use in another medium; for a variety of reasons, a smaller inventory may be used than would be phonemically precise. There are universal constraints on simplification in the phonological inventories of languages in contact, although the full set of mature contrasts is still present in the speaker's competence (cf. Fox, in press). Likewise, the adaptation of phonological distinctions to the reduced number used in metrical systems and in baby talk is subject to the same universal constraints on simplification of the full set of mature contrasts (Devine and Stephens 1976:425-427; Ferguson 1964:109). Universals in pidginization, metricization, and baby talk follow the same, standard markedness hierarchy.

These three cases of language adaptivity — pidginization, metricization, and writing — all point to a competence for simplification whose principles are universal. All require the processing of linguistic information to reach a reduced inventory so that the principles must be in part psychological.[30]

It appears that many universals derived immediately from the processes of historical change, by the merger of once-separate phonemes or by the creation of new phonemes through divergence in some types of articulation, have the same constrained patterns as more psychologically motivated processes of language adaptation. The two are clearly related; this suggests that either the marked phonemes are objectively more complex than the unmarked, or that their selection is based on an innate and thereby universal subjectivity. Such views are required by the convergence of many different classes of linguistic phenomena into the same universal constraints. Writing, then, is one more aspect of language use that fits into the emerging perspective of language universals.

This essay began with the expectation that there is a fairly direct correspondence between universals in speech and linguistic universals of writing; this has been largely, but not entirely, substantiated. The universality of patterns in script depends on the universality of strategies for processing language. Universal constraints in writing and speech need correspond only when the same language-processing strategies are relevant in both writing and speech. So far as they have been investigated above, for example, statements that phonemes of type *X* are represented if phonemes of type *Y* are represented always correspond to statements that phonemes of type *X* exist in a language if phonemes of type *Y* exist in the language. Syncretism of phonemes of the marked class is reflected in such statements comparing two classes of phonemes; because the marked phonemes are perceptually more similar to each other than are the unmarked (Greenberg and Jenkins 1964; Mohr and Wang 1968), this syncretism can be expected in both writing and speech.

Where writing and speech do not share the same basis for language processing, however, the results of the two may differ. For example, a single phoneme is a class with only one member, so that syncretism with other members of its class is impossible. In such cases, syncretism in an unmarked class with several member phonemes may occur without syncretism in a marked class with a single member.[31] Likewise, a single marked phoneme may be under-represented for a variety of reasons; syncretism of phonemes of an unmarked class may then occur, or fail to occur, independently of the behavior of the marked. Of all the universals of speech tested, the only one whose counterpart in script was not verified is of just this one-phoneme sort; the results were indeed random (cf. discussion of [33]).

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[30] Elaboration is also exemplified both in writing and in language contact, and seems to point to the same conclusion. For example, reduplication is commonly used in creolization of languages and in expansion of logographic scripts to indicate extension of the character of a meaning in space or time, giving rise to such concepts as plurality, size, intensification, continuation, and repitition (Justeson, in preparation).

[31] For example, since voiced stops are more similar perceptually than voiceless stops, voiced

As discussed in Section 1.1, linguistic constraints on writing that are not the same as in speech are nevertheless to be explained by reference to spoken language.[32] The constraints on glide representation stated in [29] and [30a] have no counterpart in speech; the other implications do. To understand this exception, it should be noted that glides appear automatically under various phonetically-defined conditions the world over, and in other positions often assimilate easily to other phonemes or are lost altogether. In such uses, there is a greater phonological similarity to zero than for any other kind of consonant phoneme. This does not result in universal implicational relationships of the type noted in [30a] for speech; glides readily shift between phonetic and phonemic status in response to changes in vowel distributions which can occur quite independently of the phonemic glide inventory. In cases of language adaptation, however — where the full set of phonemic contrasts is part of the competence of the language user — one would expect to find correlates of [30a], In pidginization of languages having /h/, /w/, and /y/, /w/ should be lost if /h/ and /y/ are both lost; /w/ should be retained if /h/ and /y/ are retained. In poetics, for the purposes of alliteration or rhyme, some consonants may be treated as interchangeable with others; /h/ and /y/ should not be equated here unless /w/ is also equated with them. Correlates of [29] should also be found in these cases of adaptation. I can neither prove nor refute the validity of such claims at this time.

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stops merge with each other more easily than voiceless stops; thus there is syncretism in the voiced stops if there is syncretism in the voiceless. If a language *L* has only one voiced stop, however, its perceptual similarity to other voiced stops in other languages is not perceptually relevant in *L*; voiceless stops of *L* can merge regardless of what happens to the single voiced stop. Here there is syncretism in the (unmarked) voiceless stops without syncretism in the voiced. Likewise, in a writing system for *L*, there might be syncretism in the use of the sign of one voiceless stop for another, but there can be no use of the sole voiced stop for another voiced stop. This would be a perfectly lawful exception to [36].

[32] Lounsbury's (1973:124-125) proposal of correlated diachronic and synchronic constraints on variable ordering of elements in collocations of logosyllabic scripts have no direct counterparts in speech; yet his presentation can be considered a classic example of a 'state-process' approach to linguistic regularities of writing systems.

	OR	
	+	-
A	28	3
S	6	6

	OR	
	+	-
Sm	28	3
La	6	6

	OR	
	+	-
SmS	2	0
LaA	2	0

	OR	
	+	-
Log	7	0

p=.008

A	.903	.097
S	.500	.500

p=.008

Sm	.903	.097
La	.500	.500

SmS	1.000	.000
LaA	1.000	.000

Log	1.000	.000

Table I. Over-representation (OR) of phonemes

	OR	
	+	-
A	15	10
S	4	2

	OR	
	+	-
Sm	17	8
La	2	4

	OR	
	+	-
Log	4	1

p=.574

A	.600	.400
S	.667	.333

p=.137

Sm	.680	.320
La	.333	.667

Log	.800	.200

Table II. Over-representation adopted through borrowing (among borrowed scripts)

	OR	
	+	-
A	23	8
S	6	6

	OR	
	+	-
Sm	25	6
La	4	8

	OR	
	+	-
Log	7	0

p=.125

A	.742	.258
S	.500	.500

p=.005

Sm	.806	.194
La	.333	.667

Log	1.000	.000

Table III. Over-representation of phonemes (excluding loan phonemes)

	OR	
	+	-
A	4	23
S	3	8

p=.320

	OR	
	+	-
A	.148	.852
S	.273	.727

	OR	
	+	-
Sm	4	24
La	3	7

p=.257

	OR	
	+	-
Sm	.143	.857
La	.300	.700

	+	-
Log	4	2

	+	-
Log	.667	.333

Table IV. Over-representation of semivowels

	OR	
	+	-
A	9	20
S	2	9

p=.349

	OR	
	+	-
A	.310	.690
S	.182	.818

	OR	
	+	-
Sm	9	21
La	2	8

p=.432

	OR	
	+	-
Sm	.300	.700
La	.200	.800

	+	-
Log	0	7

	+	-
Log	.000	1.000

Table Va. Representation of allophones

	OR	
	+	-
A	8	21
S	0	11

p=.056

	OR	
	+	-
A	.276	.724
S	.000	1.000

	OR	
	+	-
Sm	8	22
La	0	11

p=.061

	OR	
	+	-
Sm	.267	.733
La	.000	1.000

	+	-
Log	0	7

	+	-
Log	.000	1.000

Table Vb. Representation of allophones (excluding semivowels)

	OR	
	+	-
A	5	25
S	2	10

p=.688

A	.167	.833
S	.167	.833

	OR	
	+	-
Sm	4	26
La	3	9

p=.312

Sm	.133	.867
La	.250	.750

	+	-
Log	2	5

Log	.286	.714

Table VI. Over-representation of phonemes (excluding allophones, semivowels, borrowings, and loans)

	UR	
	+	-
A	25	7
S	17	1

p=.132

A	.781	.219
S	.944	.056

	UR	
	+	-
Sm	24	7
La	18	1

p=.108

Sm	.774	.226
La	.947	.053

Table VII. Under-representation of phonemes

	UR	
	+	-
A	12	19
S	12	6

p=.055

A	.387	.613
S	.667	.333

	UR	
	+	-
Sm	11	19
La	13	6

p=.030

Sm	.367	.633
La	.684	.316

Table VIIIa. Under-representation of phonemes (excluding borrowing)

	UR	
	+	-
A	19	7
S	9	2

p=.454

A	.731	.269
S	.818	.182

	UR	
	+	-
Sm	19	7
La	9	2

p=.454

Sm	.731	.269
La	.818	.182

Table VIIIb. Under-representation due to borrowing

	Suppl	
	+	-
A	12	10
S	4	11

p=.089

A	.545	.455
S	.267	.733

	Suppl	
	+	-
Sm	11	10
La	5	11

p=.171

Sm	.524	.476
La	.313	.687

Table IX. Deficiencies made up (Suppl) by letter-sequence conventions

	Suppl	
	+	-
A	11	3
S	2	7

p=.021

A	.786	.214
S	.222	.778

	Suppl	
	+	-
Sm	11	3
La	2	7

p=.021

Sm	.786	.214
La	.222	.778

Table X. Borrowed deficiencies made up by invention of signs

		$\breve{V}$	
		+	−
$\bar{V}$	+	6	0
	−	12	11

Table XI. Representation of short and long vowels

		$\bar{V}$	
		+	−
D	+	2	0
	−	4	13

Table XII. Representation of long vowels and diphthongs

		V	
		+	−
$\tilde{V}$	+	3	0
	−	3	0

Table XIII. Representation of oral and nasal vowels

		P	
		+	−
C	+	5	0
	−	3	3

Table XIV. Representation of peripheral and central vowels

L(UR)

	+	-
A	8	24
S	8	9

+	-
.250	.750
.529	.471

p=.101

Table XV. Under-representation of liquids

G(UR)

	+	-
A	19	12
S	10	7

+	-
.613	.387
.588	.417

p=.554

Table XVI. Under-representation of glides

G(UR)

L(UR)	+	-
+	5	2
-	15	9

A

G(UR)

L(UR)	+	-
+	7	1
-	3	6

S

Table XVII. Under-representation of glides and liquids

y

	+	-
A	16	9
S	10	6

p=.590

A	.640	.360
S	.625	.375

w

	+	-
A	13	10
S	10	6

p=.487

A	.565	.435
S	.625	.375

h

	+	-
A	23	6
S	5	9

p=.007

A	.793	.207
S	.357	.643

?

	+	-
A	1	9
S	1	3

p=.505

A	.100	.900
S	.250	.750

Table XVIII. Representation of glides (detail)

		G	
		+	–
ʔ	+	2	0
	–	5	10

Table XIXa. Co-representation of /ʔ/ with /h/, /w/, and /y/

		G	
		+	–
ʔ	+	5	0
	–	5	7

Table XIXb. Co-representation of /ʔ/ with /h/, /w/, and /y/ (excluding glide/vowel confusions)

		w	
		+	–
y	+	20	2
	–	2	12

		w	
		+	–
h	+	16	6
	–	5	9

		y	
		+	–
h	+	17	6
	–	8	6

Table XX. Pairwise co-representation of /h/, /w/, and /y/

		h			
		+		–	
		y		y	
		+	–	+	–
w	+	14	1	5	0
	–	0	4	2	5

Table XXI. Co-representation of /h/, /w/, and /y/

		L	
		+	-
L*	+	4	0
	-	5	2

Table XXIIa. Representation of marked and unmarked liquids (representation indicated if any phoneme is represented)

		L	
		+	-
L*	+	4	0
	-	3	4

Table XXIIb. Representation of marked and unmarked liquids (under-representation indicated if any phoneme is under-represented)

		l	
		+	-
l*	+	2	0
	-	3	1

		l	
		+	-
r*	+	3	0
	-	3	0

		r	
		+	-
l*	+	2	0
	-	1	3

		r	
		+	-
r*	+	3	0
	-	2	1

TableXXIIc. Representation of marked and unmarked liquids (detail)

		l	
		+	-
r	+	31	0
	-	4	6

Table XXIIIa. Representation of /l/ and /r/

		l	
		+	-
r	+	118	33
	-	49	3

p=.049

Table XXIIIb. /l/ and /r/ in spoken languages of 203-language sample

		E	
		+	-
ʔ	+	1	0
	-	0	2

		I	
		+	-
ʔ	+	0	0
	-	5	0

Table XXIV. Co-representation of /ʔ/ with ejective and implosive stops

		C^v	
		+	-
C*	+	13	0
	-	10	4

Table XXVa. Representation of voiced and more marked stops

		C^v	
		+	-
C*	+	24	0
	-	6	0

Table XXVb. Distinction of voiced stops from each other and of more marked stops from each other

		C^{vl}	
		+	-
C^{v}	+	32	0
	-	1	12

Table XXVIa. Representation of voiced and voiceless stops

		C^{vl}	
		+	-
C^{v}	+	39	0
	-	2	4

Table XXVIb. Distinction of voiceless stops from each other and of voiced stops from each other

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The Plural in Semitic

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It is a well-known fact that in Semitic, just as in Indo-European, it is the attribute which contains the overall exponent of the grammatical gender. The gender of a noun is as a rule expressed by the form of the adj. etc., not always by the form or the semantic content of the noun itself. Thus in Hebrew an overt formative of gender (-*ā*) is attached to nominal stems only to express a difference of sex, e.g. *malk-ā* 'queen' versus *melek* 'king', pl. *malk-ōt : mlak-īm* (*-at* : zero; *-ōt* : *īm*).

In adjectives and participles the formal difference of gender, both in the singular and in the plural, is entailed by the fact that used independently as nouns they express a difference of *sex* (male : female) on the one hand, of human versus non-human on the other: Heb. *ṭōb* 'bonus (a good one)', *ṭōbā* 'bona' (female), *ṭōbīm* 'boni' (good people): *ṭōbōt* 'bonae' (females) and at the same time 'good things'. Although the primary syntactical function of the adjective is to serve as attribute, the inflection of the latter is identical with that of the substantivized adjective (representing only a secondary function of this part of speech). But whereas in the latter function the inflectional formatives (desinences) stand for the categories *sex* and *human*, in the attribute their distribution is governed by the determined nouns. One and the same inflection has a semantic value in the former, a syntactic one in the latter case. It is here that the distribution of the inflectional formatives of the attribute dominated by the noun corresponds to what is called grammatical gender.

In the plural the endings Heb. *-īm*, *-ōt* of the independent (substantivized) adjective denote male and female humans respectively, but owing to the binary system of gender in Semitic the ending *-ōt* corresponds also to the IE neuter plural, hence e.g. *gdōlōt* 'great things', *ṭōbōt* 'good actions, words or things'. The same use is familiar in Arabic: *al-ḥasanātu* 'beautiful things', *al-ṭaiiibātu* 'good things', *al-mauǰūdātu* 'existing things', *al-maḫlūqātu* 'things created', *al-u̯ājibātu* 'necessary things', *al-kā'inātu* 'existing things', *al'mumkinātu* 'possible things'. Akkadian still preserves the original abstract meaning: *kīnātu* ‘reality’, *damqātu* ‘the good’, *ruqātu* ‘remoteness’. A development like ‘reality’ > ‘existing things’ corresponds to a well-known logical distinction. The abstract noun represents the semantic content (quality), the collective the range of objects with this quality. The semantic shift *quality* (adjective) > *thing* (noun) entails the change *content* > *range* (= abstract > collective or plural).

The Arabic plural formatives *-ūna* and *-ātu*^{n}, a common Semitic heritage, correspond to Heb. *-īm* and *-ōt* whereas the Arabic productive procedure of forming the plural, the so-called ‘broken’ plural (*pluralis fractus*), is an innovation of South Semitic. But in all cases the rules of forming the plural involve exceptions throwing a light upon the relation between plural and gender on the one hand, between the plural and the collective function on the other. Last not least they permit a chronological difference to be established between *-ūna* (*-īm*) and *-ātu*^{n} (*-ōt*).

Among the facts referring to these questions a striking one is the ambiguous status of Heb. *-ōt* as plural formative. Its position as the desinence of the feminine plural is firmly established in the declension of the adjective, less so in the declension of the noun. Both in Hebrew and in Arabic the element **-ātu* is an exponent of the female *sex* and at the same time of the category of inanimate things or non-humans. Thus e.g. the occurrence of the Hebrew plural *i̯āmōt* ‘days’ as a rare poetical form (or rather as an archaism) proves that it must have been originally ousted as the normal expression by the attested and expected plural *i̯āmīm*. But the spread of *-īm* at the cost of an older *-ōt* has also entailed other semantic splits, viz. between the primary and the secondary (= context-conditioned or figurative) semantic function. Cf. *i̯ādīm* ‘hands’, *kappīm* ‘palms’ (of the hands), *‘ēnīm* ‘eyes’ as against *i̯ādōt* ‘arm-rests’, *kappōt* ‘handles’, *‘i̯ānōt* ‘springs’ and so on (Gesenius 1909:253). Now the secondary function is the derived and marked one, cp. e.g. the pair *tāmār* ‘palm’ (plant) : *timorā* ‘artificial palm’, pl. *tmārīm* but *timorōt*.

Such a secondary opposition between the plural forms in *-īm* and those in *-ōt* could easily engender secondary plurals in *-ōt* to express secondary semantic functions like e.g. *’rāi̯ōt* ‘(engraved) images of lions’ besides *’rāi̯īm* ‘lions’. The plurals in *-ōt* with figurative meaning furnish a clue to the relative chronology of the plural formatives *-īm* and *-ōt*. The emancipation of the secondary or figurative meaning, its getting a special morphological exponent, is due to the ousting of an original *-ōt* by *-īm* in the primary (basic) semantic function, whereas *-ōt* remains as the exponent of the secondary (or figurative) function, henceforward *autonomous* i.e. independent of the context.

But there is more to it. The gradual spread of *-īm* replacing an older *-ōt* has left intact a series of *inanimate masculine* plural forms in *-ōt* like *šēm* ‘name’, *ʻōr* ‘hide’, *qōl* ‘voice’, *māqōm* ‘place’ and many others (Gesenius 1909:253). The plural of the personal masculine *’āb* ‘father’, viz. *’ābōt* (also in Aramaic) is still an unsolved problem: *elliptic* plural (‘father + ancestors’)?

Thus far we are entitled to assume that the partial eviction of *-ōt* by *-īm* has taken place in masculine non-personal or inanimate nouns leaving a certain number of residual plurals in *-ōt* to be explained by lexical factors. The ousting of the *feminine* plural in *-ōt* by *-īm* is a different problem. Many of the feminine Hebrew nouns in *-ā* were derivatives, either collectives or mass names or else names of units (*nomina unitatis*). In the former case the collective suffix *-ā* could be replaced by the plural (originally collective) in *īm*. Cf. *dāg* ‘fish’ : coll. *dāgā*, pl. *dāgīm*. The equivalence of *dāgā* and *dāgīm* emerges from the following passages:

> Exodus 7,18 *u̯haddāgā ’ᵃšer-bai̯’or tāmūt ubā’aš hai’ or* ‘the fish in the river will perish and the river will stink’ (7,21 the same sentence in the preterite: *mētā u̯ai̯i̯ib’aš*)
>
> Numeri 11,5 *zākarnū ’et-haddāgā ’ᵃšer no’kal bmiṣrai̯īm* ‘we remember the fish we ate in Egypt’
>
> I Regum 5,13 *u̯ai̯dabbēr ‘al-habhēmā . . . u̯‘al-haddāgīm* ‘he spoke about cattle and fish’
>
> Genesis 9,2 *ubkol-dgē hai̯i̯ām bi̯edkem nittānu* ‘and all the fish of the sea will be given into your hands’

It is probable that replacement of the *abstract* suffix *-ā* by the more recent abstract and plural suffix *-īm* may be seen in *millā* = *millīm* ‘talk’ (occurring in the Book of Job) and for *’ēmā* = *’ēmīm* ‘frightfulness’ (pl. *’ēmōt*).

Between *ḥiṭṭā* and *ḥiṭṭim* there is another semantic difference, e.g. Ezekiel 4,9 *u̯’attå qaḥ-lkå ḥiṭṭīn uś‘orīm* ‘take thee wheat and barley (grains)’ as against Exodus 9,32 *u̯haḥiṭṭā u̯hakkussemet lo’nukkū* ‘but the wheat and the spelt have not been beaten down’. Similarly in the case of *ś‘orå* and *ś‘orim*: Ezekiel 4,9 (cf. above) versus Deuteronomy 8,8 *’ereṣ ḥiṭṭā uś‘orå* ‘a country of wheat and barley’. This difference between the expressions for mass and unit is sometimes neglected, e.g. II Samuel 14,30 *ḥelqat i̯ō’āb ’el-i̯ādī u̯lōšām ś‘orīm* ‘Joab’s plot adjoins mine and he has barley there’.

It is highly probable that forms like *dbōrā* ‘bee’, *i̯ōnā* ‘dove’, *’lummā* ‘sheaf’, **bēṣā* ‘egg’, *lbẹnā* ‘brick’ also represent *nomina unitatis*, compare Arabic *baiḍu/baiḍatu* ‘egg’, *labinu/labinatu* ‘brick’, *naḥlu/naḥlatu* ‘bee’, *ḥamāmu/ḥamāmatu* ‘dove’. The name of the terebinth Heb. *’ẹlā* is also considered by Gesenius (1915:37) as a *nomen unitatis*. All these names of units in *-ā* form, just as *ḥiṭṭā* and *ś‘orā*, a plural in *-īm*: *bẹṣīm, lbēnīm, dbōrīm, i̯ōnīm, ’ēlīm*. Also *šibbolet* ‘ear’ (of corn) : *šibblīm*, cf. Ar. *sunbulatu*^{n} : pl. *sunbulu*^{n} (originally name of unit versus collective).

The fact that the formative *-ā* denoting a unit is removed before the exponent of the plural, is not more surprising than e.g. the removal of the present suffix before the aorist suffix *-s-* in Indo-European (thus Gk. *deik-nȳ-mi ; e-deik-s-a*), the two morphemes *nȳ* and *s* being contradictory.

There is a close correspondence between Hebrew and Arabic as regards the plural of the word for ‘year’: Heb. *šānōt* and *šānīm*, Ar. *sanau̯ātu*^{n} and *sinūna*. At least Heb. *šānot* seems to be an archaism occuring 9 times as a poetical form besides the normal and probably younger plural *šānīm*.

The lack of fem. *-ā* is also responsible for a plural like *pīlegeš* ‘concubine’ : *pīlagšīm, rāḥēl* ‘ewe’ : *rḥēlīm*, *‘ēz* ‘she-goat’ : *‘izzīm*, whereas *’ẹm* ‘mother’ and *’ātōn* ‘she-ass’ have *-ōt* (*’immōt, ’tōnōt*). The pl. *nåšīm* from *’iššå* ‘woman’ is only a case of suppletion (Ar. *’unṯā*, but *nisā’u*).

The whole state of affairs indicates an original expansion of the plural suffix *-īm* which starting from personal masculine nouns invaded the domain of the non-personal masculine nouns, then partially that of the *nomina unitatis* and collectives in *-ā* and even of non-characterized feminines with natural gender (sex). Other feminines have preserved the plural in *-ōt* owing to the substantivized adjective where *-īm* was restricted to the personal (or animate) masculine. In general the encroachment of *-īm* on *-ōt* has been greater in the noun than in the (substantivized) adjective. In the preliterary period plural forms in *-ōt* from inanimate masculines and hesitations between *-ōt* and *-īm* must have been more frequent than in the language of the Old Testament.

In Arabic the old distinction between *-ūna* and *-ātu*^{n} has been superseded by the repartition ‘broken plural’: regular plural (*-ūna* and *-ātu*^{n}) entailing a certain change in the relation of genders.

The broken plural has restricted the range of *-ūna* chiefly to the masculine form of the adjective. In primary adjectives the ending *-ūna* is used only if referring to persons (humans); but it is the rule for the masculine plural of *derived* adjectives: verbal adjectives with a feminine in *-atu*^{n}, relative adjectives in *-i̯i̯u*^{n}, elatives of the form *’af‘alu*. In the noun *-ūna* is maintained in masculine proper names and in diminutive nouns denoting humans. Besides there is only a small number of masculine nouns (about 10) which form the old plural in *-ūna: ’abūna, ’aḫūna, ’ahlūna, ‘ālamūna* and others.

The feminine desinence in *-ātu*^{n} is of course obligatory in all adjectives with the masculine plural in *-ūna* (cf. above), in feminine proper names and in masculine proper names in *-atu*. But the old *inanimate* or *non-personal* value of *-ātu*^{n} is still evident in a series of other categories: names of verbal nouns of the derived classes, of months, letters, loan-words etc. (Caspari-Müller 1876:138f.).

It looks as if the Hebrew and Arabic facts pointed to a West Semitic evolution of the plural consisting in a *partial replacement* of the oldest plural formative *-ātu* by **-ū* (Heb. *-īm*, Ar. *-ūna*), the latter serving first and above all as plural desinence of nouns denoting *male persons*. Hence a double split: 1) between the designation of male persons (with pl. *-ū*) and that of female persons (keeping the old plural desinence *-ātu*); 2) between human (pl. *-ū* or *-ātu*) and non-human (pl. only *-ātu*).

In Arabic the rise of the broken plural brought about a considerable regrouping of the old grammatical genders caused by the original value of this kind of plural. Since by its origin the broken plural is an old abstract-collective it was treated as a *singular with feminine gender*. Hence the syntactical rules concerning the form of the attribute of a broken plural:

(1)	*noun*	*attribute*
	pers. masc.	*-ūna*, rarely *-ătu*^{n}
	pers. fem.	*-ātu*^{n}, rarely *-ătu*^{n}
	impers. masc.	*-ătu*^{n}, rarely *-ūna*
	impers. fem.	*-ătu*^{n}, rarely *-ātu*^{n}

Cf. Reckendorff (1921:58f.).

The above distribution of the attributive form must have put a pressure on the inherited plural (*-ūna*, *-ātu*^{n}) of the noun: whereas plurals in *-ūna* and *-ātun* seem to postulate respectively *-ūna* and *-ātu*^{n} in the attribute, the non-personal plurals in *-ūna* and *-ātu*^{n} again prefer *-ătu*^{n} in the attribute.

The formal identification of the masculine and feminine gender in the plural of non-personal (or inanimate) nouns must have entailed a weakening of the status of gender in the corresponding singular. The inflection of the attribute of non-personal plurals being *reduced* with relation to that of personal plurals, cf.

(2) personal noun: attribute sing. *-u*^{n}, *-ătu*^{n}, pl. *-ūna*, *-ātu*^{n}
↓ non-personal noun: attribute sing. *-u*^{n}, *ătu*^{n}, pl. *-ătu*^{n};

this fact started the following consequence: the pressure of *plural attribute -ūna/-ātu*^{n} : pl. attribute *-ătu*^{n} contributed to weaken the difference *-u*^{n}/*-ătu*^{n} in the singular of non-personal nouns.

If there hasn't been a complete swamping out of all difference of grammatical gender in the non-personal noun, it is only because of the hesitation mentioned above under (1) ("rarely"). The final result was therefore only the spread of attributive *-ătu*^{n} in the singular of the originally masculine impersonal noun, equivalent to what may be called a *change of grammatical* gender. There are long lists of non-personal nouns which though not provided with a feminine suffix, are of feminine gender, i.e. require in the singular *an attribute in -ătu*^{n} (Caspari-Müller 1876:128-30). Moreover we find hesitations between masculine and feminine gender in the singular, and finally non-personal nouns *generis communis*, thus the non-motivated collectives denoting animals and plants, e.g. *ḥamāmu*^{n} 'doves', *naḥlu*^{n} 'bees', *naḫlu*^{n} 'palms'.

Further semantic research would be necessary in order to establish the possibility of different shades of meaning dependent on the grammatical gender. Its weakening caused by the spread of the broken plural has also left distinct traces in the agreement of the verbal predicate with the subject of the sentence. The normal word-order being verb + subject, the verb preceding a broken plural (= the old abstract) of the subject had originally the form of the 3rd. p. sing. *fem*. But if the subject was a personal masculine, the verbal predicate, though remaining in the singular, favoured the *masculine* form. And the hesitation between the masculine and the feminine form of the 3rd p. sing. entailed a corresponding hesitation between the masculine and the feminine form of the verb if the subject was a broken plural of a feminine personal noun. Starting from the broken plural this distribution of the verbal predicate was also imposed on the plural in *-ūna* and *-ātu*^{n} of personal nouns.

It has been shown elsewhere (Kuryłowicz 1972:139f.) that the starting-point of the broken plural was the semantic opposition between the verbal adjective (e.g. *qātil, qatīl* etc.) and a corresponding verbal abstract (*maṣdar*). It was the use of the verbal adjective as *noun* that caused the semantic change of the abstract into a collective (hence 'broken' plural). The fundamental layer of the broken plurals was constituted by *personal masculine nouns*, this being the meaning of the types *qātil* etc. when substantivized. The spread of the broken plural to other, chiefly non-motivated nouns was secondary and "steered partly by formal and partly by semantic factors" (1972:143).

The parallel offered by this South Semitic innovation permits a plausible conjecture regarding the Common Semitic plural in *-ū*. We have seen that this plural formative had been spreading in the preliterary period at the cost of an older *-ātu*. Once established in the masculine personal noun it ousted in a considerable measure the plural suffix *-ātu* of masculine non-personal nouns, of nouns of units and collectives in *-ătu* and even in some non-characterized personal nouns of feminine gender. The other characterized feminine nouns (in *-ătu*) proved resistent owing to the substantivized adjective where *-ātu* opposed to *-ū* represented a palpable semantic difference, that of sex.

The original value of *-ū* must have been abstract-collective just as that of the broken plural. It is this assumption which explains the replacement of the abstract-collective *-ătu* by *-ū*, as in Heb. *dāgā : dāgīm*.

The overall conclusion would be to consider *-ātu* as the oldest exponent of the Semitic plural and to assign to *-ū* (Ar. *-ūna*, Heb. *-īm*) a younger origin, although the superposition of *-ū* upon *-ōtu* is still to be regarded as a *Common Semitic* feature. In Akkadian the plural formative *-ū* (nom.), *-ī* (gen.-acc.), attested in Old Babylonian, disappears almost totally afterwards. But the different enlargements of *-ū*, *-ī* (*-m* in Hebrew, *-na* in Arabic) speak in favour of a partially independent evolution of the formative in the historical languages.

The typological comparison between the spread of *-ū* and that of the broken plural makes us assume 1) an abstract-collective value for *-ū* like for the broken plural, and 2) the *personal* noun (in its unmarked, i.e. masculine form) as the starting-point of the innovation (i.e. of the partial replacement of *-ātu* by *-ū*).

As regards the first point there is no difficulty in comparing *-ū* with the denominal abstracts in *-ū-tu* attested elsewhere: Heb. *malk-ū-t* 'kingship', *alman-ū-t* 'widowhood' etc.; Ethiopian *ḫīr-ū-t* 'goodness'; Akk. *-ū-tu* forming the plural of adjectives (old abstract). It is known that long vowels of suffixes like Heb. *-ūt, -īt*, Eth. *-ūt, -īt*, Akk. *-ūt* are due to the old feminine ending *-t* competing with the productive *-at*. Cf. *-uu̯u̯atu : -ūtu* (< *-*uu̯tu*), *-ii̯i̯atu : -ītu* (< *-ii̯tu*), similarly Eth. *-*autu* > *-ōt*, *-*aitu* > *-ēt*.

The *-ī* of the genitive-accusative may be explained either phonetically by *-uu̯i* > *-ui* > *ī* (cf. Ar. *qīla* < **quu̯ila*) or morphologically by the proportion nom. *-ŭ* : gen.-acc. *-ĭ* = nom. pl. *-ū* : gen.-acc. pl. *-ī*.

The second point, i.e. the personal noun in its fundamental (masculine) form as the point of departure of the plural in *-ū*, is justified by the spread of this ending. We have to do with a *universal*. Language, based on the axis *I : thou*, is by its nature *anthropocentric*. The non-human (non-personal) or inanimate elements are *marked* and subordinate to *human*, in contradiction to the usual terminology where the negative prefixes *non-* and *in-* serve in general to denote the neutral-negative, i.e. the unmarked, fundamental terms. Therefore the spread of formatives, originally limited to human, from human to non-human ('personification', though in a purely linguistic sense) is to be considered as the normal phenomenon, cf. Engl. *-er* or Fr. *-eur* (suffixes forming first agent nouns, then also nouns of instruments), or the ousting of the neuter desinences by masculine and/or feminine desinences in Romance declension, and so on. The counterpart of this normal development is 'depersonification', a stylistic device of using formatives proper to 'non-human' to derive or inflect personal nouns to express disregard or disparagement. E.g. Pol. *-i* (pl of masculine personal nouns) : *-y* (pl of non-personal masculine nouns, but desinence of disparagement when used with personal masculine nouns).

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Grammar and Freedom[*]

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Why study a language? As Socrates might have said, this question already presupposes that we know what it is to study and understand a language. Unfortunately, there have been many discussions of the question at hand without a careful examination of the underlying issues. This essay is an attempt to say a few things about the underlying issues that will help us in giving a less superficial answer to the initial question than the ones we have become accustomed to.

The value of practical arguments for studying a foreign language tends to fluctuate. When Americans are in a less isolationist mood, the arguments tend to carry some weight. But then, again, when English becomes "the esperanto of the modern world" the argument loses force. These fluctuations support the view that the claim for the importance of understanding languages should not be based on the quicksand of expediency. Deeper insights are called for.

In recent decades instruction in foreign languages, like instruction in English, suffered from the effects of a tacitly accepted argument; an argument whose unsoundness, however, becomes apparent as soon as we make its premises explicit. Following a slogan derived from the teachings of John Dewey, it was assumed that learning by doing is the right way, and that whatever we teach should be made exciting and fun. Within its own context, properly understood, this slogan is not harmful. But in its alleged application to the study of foreign languages it was assumed to have the consequence that since "grammar is dull", we should teach languages by getting students to learn large parts of these without any firm foundation in the understanding of grammar. In short, "learning by doing" was taken to mean that the main thing is to get students to be able to say a few sentences; and the "make things exciting" slogan was taken to mean that devoting much time to the teaching of grammar as such was unwise.

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[*] An earlier version of this essay was presented at the October 16, 1976 meeting of the Foreign Language Association of Northern California. I am delighted to be able to dedicate the current version to my colleague, Joseph Greenberg, whose erudition and scholarship have been an inspiration to us all.

The two main weaknesses of this argument are: the claim that grammar is dull, and the assumption that learning grammar does not contribute something deep and significant towards our understanding of human nature and ourselves.

Another way of getting at the malaise manifested by this unsound argument is indicated by the following. The rise of so-called progressive education came hand in hand with the rise of the notion that self-expression for a child should be of paramount importance, and that a condition for self-expression is freedom. Again, taken within the proper context, such a view need not have harmful consequences for education. But the conception of freedom embodied within this slogan was taken to be in conflict with the notion that the foundation of education was the mastery of certain types of rules.

Is grammar dull and peripheral? Is the learning of a foreign language merely a routine rather than one of the central humanistic disciplines? Should we take 'freedom' to mean simply 'being free from rules'? In the rest of this paper we shall marshal support for negative answers to these questions. Let us not make any mistake about what is at stake. If the arguments to be put forward are sound, they will enable us to view the study of grammar as one of the key elements in our effort to understand human understanding, and the conception we gain will show true human freedom to be not incompatible with rule-understanding and rule-following, but rather as entailing the latter. Without rules there is no creativity, and without creativity there is no freedom for a rational creature.

1. The fascination of grammar

It is often assumed that in order to make the learning of a foreign language interesting and 'relevant', we have to link it to the cultural context, and emphasize constantly its applications to successful communication. Again, within a balanced conception of the nature of language teaching, emphasizing cultural and communicational aspects has its proper place. But to stress these at the expense of other things is to miss what the essence of a language, indeed the essence of *language*, is. It is curious that we should have so much trouble getting a proper perspective on the nature of human languages. After all, these permeate our everyday experience, more than many of the other things that we find easier to study. And yet, as Wittgenstein suggested, perhaps this is the cause of the problem. We find it relatively easy to study the things that are large and are very far away from us (hence the early success of astronomy), or the things that are very small and need the tools of modern technology to become observable (hence the success of physics and chemistry); but we find it very difficult to get proper perspective on the things that are 'too close to us', precisely because they form the very fabric of everyday experience. We are so accustomed to these phenomena that we tend to take their most problematic aspects for granted. The problem for understanding language is not a paucity of facts; on the contrary, we have only too many facts at our disposal. Amidst this plethora of facts we find it difficult to discover and focus on what the *fundamental facts* are that need explanation.

Thus the first step in the right direction is to make both teacher and student become aware of THE MIRACLE OF LANGUAGE. The amazing facts, that by making certain sounds people can convey to each other the kind of information that makes up a body of scientific knowledge; and that people at different times, in different contexts, can produce sequences of sounds in different languages which nevertheless express the same set of thoughts — thus making, e.g., the dissemination of the truths of mathematics and geometry possible. Again, the amazing fact that the production of and reaction to sequences of sounds of certain complexity enables us to share feelings, to love and cooperate, and to express respect for each human as an independent center of reasoning and feeling.

It is not enough to say that the human ability to produce and interpret sound patterns of a certain complexity is solely responsible for these miracles, though no doubt this is an important part of it (without the human larynx and the human ear, no human languages). Nor is it enough to add that some units of language have meanings, though that, again, is an important part of the picture. For a mere jumble of meanings does not add up to a thought; and a mere jumble of thoughts does not add up to an argument. The explanation for this lies in seeing that a mere jumble of words does not make up a sentence, and a mere jumble of sentences does not make up more complex units of discourse. Beyond meaning lies a *structure*; the structure that makes the formation of thoughts, arguments, etc. possible. This structure is grammar.

In order to appreciate the fundamental role of grammar, we must see the relationship between thought and language in the proper light. For though it is true that the same thought can be expressed via different syntactic forms, we have no way of specifying what a thought is, except by reference to the variety of syntactic forms within which thoughts are formulated. We do not individuate thoughts according to the individuation of syntactic structures, but neither can we talk about, or specify, thoughts independently of *any* syntactic structure. The ability to think, and the ability to interpret syntactic structures should be kept distinct, for there is no reason why one should not allow for thinking of a certain kind within less complex organisms. But it is the link with syntax of a certain level of complexity that distinguishes *human* thoughts. The level of complexity of human thoughts can be specified only by reference to the complexity of the grammars of the languages within which they are expressed.

This insight should help us in coming to grips with certain popular fallacies; fallacies that, though popular in the classroom, make their way also — at times in hidden form — into textbooks and learned disquisitions. Let me mention three of these.

First, there is the slogan: "I have a good set of ideas; it's just that I have difficulty expressing these". This suggests a role for language as a kind of clothing or wrapping with which ideas or concepts are to be covered as they appear in the daylight of public communication. If what is said above is correct, then this conception of 'language-disembodied ideas' cannot be right. From the admitted fact that the same thought or idea can be expressed in a variety of syntactic ways, it is concluded — fallaciously — that ideas may exist entirely apart from the range of syntactic frames within which they are expressed.

The second slogan, often heard from the student who becones exasperated with the details of the grammar of a foreign language — or, for that matter, the grammar of his own language — goes like this: "Why should I care about grammatical correctness? Isn't it enough if I succeed in communicating to people what I want?" Behind this conception we find the implicit assumption that the syntactic potentialities of a language have nothing to do with the potentialities of developing varieties of thoughts. And yet, as we saw above, the varieties of grammars are not merely varieties of ways of expressing some antecedently given stock of thoughts; rather, only the appreciation of syntactic subtleties gives us an adequate appreciation of the varieties of subtle differentiations between thoughts.

Finally, even people of goodwill who might agree with much that has been said so far think at times that this link between thought and grammar requires that we should be able to give some sort of functional justification for each rule of grammar; somehow explaining how it serves some purpose of conveying meaning. Now nobody denies that syntactic structures *in general* enable us to convey meaning and information; but this does not lead one to see syntax as a mere means to an antecedently given end. Syntactic structure reflects many things; the human biological structure, perceptual strategies etc. in addition to semantic conditions. Furthermore, it does this only in some of the infinitely many possible ways. Thus the delineation of the range of possible human syntactic structures cannot be accomplished by trying to determine these on the basis of these functional needs alone.

If we can weave these considerations into our teaching of foreign languages (as well as into the teaching of English), then we might succeed in getting the student to see 'the miracle of language' and the position of grammar as the key factor in this miracle. Ultimately, however, there is no substitute for a genuine fascination with, and indeed love for, linguistic structures. We have to awaken in students a deep care for language. This deep care for language culminates in a deep care for grammar, and is analogous to the artist's care for artifacts, or the child's care for beauty. But it need not be viewed as an idiosyncratic aesthetic preference. For in caring for language and grammar, we care for what we are; thinking feeling human beings.

2. Rules, creativity, and freedom

'Freedom', like so many other abstract singular terms, appears to be deceptively simple. What is it to have freedom? What is it to be free? Turned back into adjectival form, the incompleteness of the term becomes apparent. Nobody can be free *simpliciter*. When someone is free, then that person is *free from* certain constraints, and *free to* do certain things. Furthermore, the desirability of being free from many given constraints must be considered separately for any given species. A specific state of being free from certain constraints and being free to do certain things will be different for humans, robots, tigers, etc. Thus our question about freedom is really: what are the things that humans ought to be free from, and ought to be free to do? A simple-minded answer would be: they ought to be able to be themselves. But what is it for a human to be himself or herself?

We are led back to the notion that we started out with; namely that hunans are thinking and feeling beings, and that the unique complexity and forms of their thoughts and feelings is reflected only by language.

There is no thinking without rules. Both logic and grammar conspire to make it possible for us to articulate thoughts. It is absurd to think of rules as restricting thinking; rules of coherence, consistency, and grammaticality are what make thinking possible. An analogy with games like chess should make this clear. It would be absurd to complain about the fact that there are rules for chess and that this might *restrict* our ability to play chess. The very possibility of playing chess is given by the fact the game is defined in terms of rules; the rules are the essence of the game. Learning and following rules do not restrict our lives. On the contrary, they enhance our lives and enable us to be free to participate in a large number of activities.

Needless to say, there are rules and rules. Some rules are constitutive of rational activities and thus enhance our freedom (and the rules of grammar fall into this class), while other types of rules restrict our ability to develop human potentialities. Furthermore, some of the constitutive rules require creativity in their application and reapplication to novel situations.

To be free to do things that reflect our true human nature is to be free to be creative. But there is no creativity without rules. To be a rational creative creature is to be able to build on pre-existing rules, to reapply and reinterpret them in new contexts, or to modify them, and at times replace them with new ones. But it is meaningless to talk about creativity in art, science, literature, or human relations, without presupposing a set of rule-governed activities. The composer, the artist, and the speaker of everyday language learn to be creative by learning how to follow and understand rules, even if these need occasionally to be modified or replaced.

These reflexions show us how misleading it is to contrast human freedom with rules and rule following. A human who wants to be free from all rules is a creature who wants to lose its humanity. For in that condition this creature would lose its ability to partake of such distinctively human activities as the articulation of thoughts, feelings, self-awareness, and the recognition of others as ends in themselves. This point should not be confused with another issue, namely, the specification of types of constraints that we want to be free from. Among these are rules that prevent us from being able to share in and cooperate with others in activities that define our nature; e.g. rational dialogue, the development of friendship, and activities in which we join in order to secure food and shelter for those whom we regard as members of our community.

Let us survey briefly this part of the discussion. Some rules are restrictive in the special sense that they hinder us in our efforts to realize our human potential. Rejecting such rules will help us in doing the things that define our nature. But doing many of these things involves the understanding and mastery of constitutive rules; i.e. rules that make creative thinking — whether in art, engineering, or mathematics — possible. Rules of this type are hardly the things that we want to be free from.

We, educators, face a twofold problem. On the one hand, the distinction between the two types of rules that has been sketched here has not been drawn — or, at least, has not been drawn sharply and frequently enough. On the other hand, in so far as such a distinction is applied at all, on a semi-conscious basis, the rules of grammar tend to be lumped together with the wrong kind of rules. They are viewed as restrictive instead of as liberating; constraining our modes of expression instead of as what makes rational modes of expression possible. Thus a challenge faces us; we must draw this distinction and we must show how and why the rules of grammar should be viewed as the kind of rule that makes creativity and human freedom possible. If we do not face up to this task, nobody will do it for us.

It might be objected that so far only the need to emphasize the creative aspects of language use in teaching a language has been defended. How does this support the claims that we should emphasize the teaching of foreign languages and the role of grammar? This objection can be met by an application of the Socratic maxim that the unexamined life is not worth living. Applied to the use of language, the maxim says that a free rational being would want to be able to reflect on what makes the creative use of language possible. Thus such a being would want to be able to know and consciously use the rules of grammar that form the backbone of language. But in order to understand fully the potentialities of human grammatical structures, one has to look at more than one grammar. It would be difficult to think of another field of study that reveals both the variety and differences in human thinking and the deep underlying common elements as well as does the study of foreign languages. Such studies are not the mere absorption of routine and skill. Viewed in the proper light they reveal to us the full potential of one aspect of what it is to be human. It is said at times that man is a rational animal, but the notion of rationality is too vague to be very informative. One of the clearest and empirically best justified ways of sharpening the classical definitions is to say that man is a syntactic animal. The level of complexity of his thinking and the kind of creativity that is required even in the most mundane and commonplace use of everyday language can be best measured and understood when one studies the formal properties of a variety of grammars for natural languages.

Thus, since we want to be free to do the things that are distinctively human, and the exploitation of the full potential of language use that grammar makes possible is one of these things, we want to develop this potential as well as to be conscious of the rules that make such an activity possible. This is the main argument for assigning to the study of languages a central role in a truly humanistic educational scheme.

In this section we have argued for the following. There can be no genuine self-expression without expressing what constitutes our selves, i.e. our humanity. Such self-expression requires the articulation of thoughts. To be free to articulate our thoughts is not to be free from all sorts of rules. On the contrary, it is to master, follow, and reapply, in short, make one's own, constitutive rules such as the rules of grammar and logic. Rule governed activities and human freedom are inextricably interwoven. In order to see this, we have drawn a distinction between rules that hinder genuinely human activities and rules that are constitutive of genuine human activities and thus enhance creativity and freedom. It takes but little reflexion to see that along with the rules of logic, mathematics, etc. the rules of grammar too belong to this, 'freedom-making' core.

Viewed in this light the study of syntactic rules can be seen as liberating the human mind. They make us aware of possibilities of expressing thoughts that might have eluded us otherwise. Without them we are left in a more constrained and less free state of mind. It is the person without knowledge of grammar, and without the knowledge of foreign languages who is not free, and it is the person who possesses these types of knowledge who has succeeded in lifting some of the human bondage.

3. Humanistic education and the foreign languages

When devising curricula or graduation requirements, or distributing money for research, we tend to evoke the distinction between the humanistic and the scientific. Art and literature are supposed to be paradigms of the humanistic, while physics and chemistry exemplify the scientific. Where do we fit the foreign languages into this classification?

Perhaps we should stand back and ask ourselves whether it is really necessary to fit the study of foreign languages into this ill-drawn dichotomy. Not much of substance has been said in support of the distinction as it is usually drawn. Factual information, sensitivity, and reasoning skills are needed both in humanistic and in scientific studies. The sensitivity of the humanist in his appreciation of art and poetry is matched by the sensitivity of the scientist in his appreciation of the elegance and simplicity of an outstanding theory. Nor will it do to charge the humanistic disciplines with the study and cultivation of values. Every discipline contains rules and laws, and every rule and law has its normative as well as descriptive aspect. Thus no one discipline or kind of discipline has a monopoly on norms and values.

The interwoven fabric of norm and fact can be seen clearly when we reflect on the task of the grammarian. We are used to hearing debates on whether the task of the linguist is normative or descriptive. A proper understanding of the role that constitutive rules play should put such debates to rest. Of course, every grammar is prescriptive. If it were merely to encode how people in fact talk, it would be of no use to the language learner and of no interest to those who try to construct a theory of human languages. A grammar — as well as other components of a theory of a language — should tell us not how we in fact speak, but how we should speak. A textbook of simple arithmetic does not tell us — fortunately — how we in fact calculate, but how we should calculate. At the same time, the normative force of the relevant rules is derived from facts. An adequate grammar is not giving us an arbitrary prescription for speaking a language. Its prescriptions must be grounded in fact. Thus they neither tell us how people in fact speak, nor simply how we should speak, but *how people in fact think we ought to speak* (hence the talk about intuitions of grammaticality, appropriateness, etc.). Much the same can be said — mutatis mutandis — about logic and mathematics.

We have seen thus that the fact vs. sensitivity, or the fact vs. norm distinctions do not help us in capturing what is humanistic. We are on much safer grounds if we try to link the humanistic elements to the notions of self-knowledge and the notion of something being distinctively human. To be sure, the distinctively human competences can be studied in a number of ways. But some disciplines have as their main goal the awareness and exhibition of some of these unique human capacities; thus enhancing in us the kind of self-knowledge implied by our earlier discussions. Any discipline that enhances that kind of self-knowledge by trying to exhibit and make us aware of these distinctively human capacities is, to that extent, humanistic.

We are not accustomed to linking the notion of self-knowledge to that of the study of languages, art, etc. Yet the maintenance of such a link has its roots in the philosophizing of Socrates and Plato. In modern times it has been suggested that we can achieve self-knowledge directly. One access was supposed to be introspection. Yet it is quite apparent that introspection gives us no significant clues concerning the mental processes that lead to the understanding of a sentence, or the construction of a proof, or the appreciation of a work of art. Another access was suggested by the rise of behaviouristic psychology. A wholesale adoption of the methodology suggested by that school would lead us to think of self-knowledge as having to do exclusively with the study of our own overt behaviour. But the same cognitive skills that resist introspective analysis will not yield to an analysis exclusively in terms of overt behaviour either. All of this was seen clearly at the dawn of philosophy by some of the outstanding Greek thinkers, especially Socrates and Plato. According to Plato, there can be no “direct self-knowledge”. We can know ourselves only indirectly, as our distinctive human essence is reflected in such cognitive activities as the use of language, the formulation of an argument, the completing of a proof, or the appreciation of a work of art. Since these processes are not analyzable solely on the basis of introspective or behavioural data, the best way to study them is to study their objects, i.e. the structure of language, argument, proof, or work of art. For once we understand the nature of these objects, we can give a partial characterization of the human mind as the type of thing that is capable of mastering concepts and rules of such-and-such a type.

One of the merits of recent linguistic theory is that it shows dramatically how such an approach can yield rigorous results. Some of Chomsky’s early work showed how grammars can be viewed as abstract objects with mathematically defined properties. Based on these characterizations Chomsky was able to construct an argument[1] showing that the grammars of human languages, under certain assumptions, are beyond the processing power of computers of a certain type. To be sure, it is a long way to go from this result to anything general concerning human minds and machines of certain types. But at least today we are in a position to see what *sort* of argument would both meet the requirements of a scientific rigorous argument and at the same time would lead to conclusions that would illuminate the structure of distinctively human activities.

Mention of recent linguistic theory and some of Chomsky's work inevitably raises the question of how the teacher of foreign languages should react to the rise of generative phonology and transformational grammar. As in all such cases, we face the dual danger of either reacting by saying that this is just a fad that will disappear, or by trying to assimilate and work into our curricula material that is not fully understood and whose exact bearing on the teaching of foreign languages has not been thought through carefully by most practitioners.

When faced with this question, we should distinguish three types of materials: (a) that which describes how we can give theories of language mathematical foundations, (b) that which presents a rigorous characterization of fragments of grammars of natural languages, and (c) the general methodological and conceptual assumptions that underlie (a) and (b). As for (a), this will be of interest to the curious teacher of foreign languages, but it will not have direct bearing on the way we teach foreign languages. As for (b), this can be of use to the teacher of foreign languages, but it should not be viewed as the kind of information that would conflict with what we learn from traditional philology. Transformational grammar, in general, aims at making quite rigorous and explicit the knowledge that is presented — often in semi-explicit form — by old-fashioned grammar books. Transformational grammar and traditional philology are not enemies or rivals; rather, they should be viewed as allies who together help us in understanding language. In its efforts to formalize syntax transformational grammar can supplement philology also by its enabling us to discover more abstract formal linguistic universals[2] but this is hardly against the spirit of the philological enterprise.

Just because a concept or a set of concepts is logically basic, that does not mean that it should be regarded as also psychologically basic. We have seen the danger of such confusions at the time when the 'new math' was brought into the schools. To be sure, at times students are excited and motivated by learning something about foundationally prior concepts. But it takes a lot of imagination and thorough familiarity with the material to see how such motivation can be achieved. Perhaps a greater awareness of formal syntactic universals can make the teaching of the grammars of foreign languages more interesting for certain types of students. But any sweeping claims about educational value and 'relevance' should be viewed sceptically; more concrete suggestions, empirically documented, are likely to be of more value.

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[1] For an informal presentation see Chomsky (1957:19).

[2] Current work on linguistic universals owes a great deal to the stimulus of Professor Greenberg.

As to (c), we have been doing some of this already in this essay, though our treatment has been sketchy and informal. Again, it is a matter of the type of student and the orientation of the teacher whether some of this can be worked into a stimulating presentation that will help in motivating students to study grammar.

In short, the new linguistics offers no panacea for the teacher of foreign languages who wants to motivate his or her students, and is looking for ways of presenting the subject effectively. I am convinced that there is no such panacea. Teaching a foreign language is an art, and thus it cannot be reduced to some simple recipe. This fact, however, should not keep us from broadening our horizons.

So far we have attempted to characterize humanistic studies as those whose primary function is the cultivation of self-awareness and the exhibiting of those competences that are believed to be distinctively human, thus helping us towards a certain kind of self-knowledge. Even certain parts of psychology could be, by this definition, humanistic if they only had as their goal understanding and not the control and modification of human behaviour. In any case, the study of language, whether in new or traditional ways, stands squarely in the midstream of a humanistic tradition defined in this manner. Though the social sciences in modern times have accumulated many facts about humans, in our current state of knowledge a grasp of the syntactic structure of human languages can tell us as much about the human mind, as anything else available to us now. Furthermore, it is the collection of neighbouring social sciences that rely on the study of languages rather than the other way around; and the same goes for such humanistic studies as history and literature.

The argument presented here applies to languages that are no longer spoken just as much as to the ones in current use. (The ones no longer spoken surely are not 'dead' on that account). The grammars of Greek and Latin provide us with some of the clearest cases of well organized bodies of rules that reveal to us the subtleties of human thinking.

To conclude, this essay tries to show that the concepts of grammar and human freedom are not so far apart as they are at times supposed to be. The arguments presented show also useful ways of defining what is humanistic, and the central role of the study of grammar and foreign languages within a humanistic education. Within this context the teachers of foreign languages have a special opportunity to present the mastery of constitutive rules and rule following in the proper light.

Therefore teachers of foreign languages should not be afraid to present some of these theoretical arguments in defence of the importance of foreign languages in the curriculum. Furthermore, they should, by all means, emphasize the study of grammar in their teaching of foreign languages. If these thoughts presented here help in bringing this about, then I shall have the highest reward that I could hope for.

Some "Universals" in Recent Research on Child Language*

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It is fitting to consider attempts to utilize the notion 'universal' in a *Festschrift* dedicated to Joseph H. Greenberg, since he has been in the forefront of modern advances in the study of linguistic universals. Two works were most influential in releasing the flood of investigations along this line: Greenberg's "Order of Affixing: A study in general linguistics", which was chapter VIII of his *Essays in Linguistics*, first drafted in 1954, and Hockett's *A Manual of Phonology*, published in 1955. Both contributed to the later conference on linguistic universals, the proceedings of which were edited by Greenberg (1963). It was neither the first nor the last time that the two age-mates made simultaneous, brilliant — and largely independent — contributions to some major topic. In all his work on the subject, Greenberg was careful to make clear just what the basis for each of his assertions consisted of, and thus ensured that, whenever he took up the topic, the result would be a solid contribution to knowledge. In Greenberg (1957:86), for example, he wrote: ". . . if our statements are very specific, that is, refer to a relatively restricted class of facts, very few universals can be asserted". If only this advice had been heeded, the present paper would have been unnecessary.

The question of universals in child language acquisition goes back at least to Jakobson (1941). Having dealt at some length with that work in Olmsted (1971), I will not discuss it further here, except to say that many of the interesting suggestions for universals first advanced there still remain to be tested. That they have not been is due, at least in part, to the tendency of late to restrict linguistic investigations to the native language of the investigator. One-language studies are, in accordance with Greenberg's dictum, cited above, barren ground in which to seek universals. Yet, oddly enough, they have been seen by their authors, in some cases, as sources of "universals". For example, Smith (1973), discussed at greater length in Olmsted (1974).

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* An earlier (and shorter) version of this paper was delivered.at the Third International Conference on Child Language held in London during September, 1975. It has benefited from discussion, then and later, by Charles Ferguson, David Ingram, Nathalie Waterson, Walburga von Raffler-Engel, and L.A. Timm. I use double quotes to indicate irony (thus "universal") and single quotes to indicate logical concepts (thus 'universal').

Even more perplexing is the "universal" founded on no known language; these are more than usually ominous since, as counterfeit coins ante'd into the psycholinguistic pot, they pass as legal tender in discussions of the foundations of linguistics. Two examples, out of many, must suffice.

Drachman (1972:997), seeking to bolster his concept of process-trains, states: "We find babbling sequences of the structure *ba-ba-ba* or *da-da-da*, but never for example an alternating sequence such as *bi-ba-bu*". Really never? Since Drachman cites no source for such an astounding assertion, one must assume it is based on his own omnilegence. Although my own recordings contain counter-examples, he could hardly be held to account for the content of unpublished notes. But the literature does contain refutations of his 'universal': for example, in Baudouin de Courtenay (1974:19), we find *gu-gi-gi-ge-gi* and (1974:21) *g:i-g:i-gö(go)*.[1] If the notion of process-train is to be useful in linguistics, presumably it will have to find stauncher support than that.

Bailey (1973), seeking the 'natural' basis of unmarking and rule-generalization, asserts that "it is to be looked for in the acquisition of language by children". He then adds the clinching argument: "Generalization is obvious: children perceive more generally at first and only later with greater specificity". Says who? (Bailey offers no citations on this portentous point). In the first place, it is difficult to determine what the sentence means, if anything. Bailey seems not to be using generalization in its more usual sense (as a technical term in psychology) where it refers to the capacity of the organism to emit a response, previously learned to stimulus A, also to stimulus B, to the extent that A and B are similar (one might be middle C and the other the C sharp that is a half-tone higher). However, neither in this nor in any other sense does generalization seem to me to be obvious. Moreover, that part of the sentence after the colon is by no means the unchallengeable "universal" that Bailey's formulation makes it out to be. The field of 'perception' is difficult even in the adult, and the process of testing perception in the infant is so difficult and the knowledge of individual differences so minute, that a statement such as Bailey's (if it is an off-hand remark based on 'commonsense') is too suspect a pillar on which to rest an important corner of his linguistic theory. If there is scientific evidence to support it, Bailey's readers would benefit greatly from citations of relevant works. Precisely because of the difficulties surrounding the notion 'perception', I spoke, throughout Olmsted (1971), of 'discriminability' rather than perception; they constitute very different research problems.

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[1] In defense of Drachman, it must be allowed that he could hardly have been expected to have seen the Baudouin work, which appeared when his own paper was no doubt in press (it had been given orally in 1972 and finally appeared in 1975).

As the foregoing discussion suggests, the misuse of 'universal' is not infrequent in recent contributions to the theory of child language acquisition. In dealing with the topic, I shall be concerned for the most part with errors produced by two classes of investigators. I call these, respectively, naive scientists and forgetful scholars. Linguistics is perhaps one of the few disciplines prone to turning up workers with both failings, standing as it does midway between the humanities and the social sciences. The recent efflorescence of activity in the study of children's language has brought forth, along with much of lasting value, a good deal of hasty generalization (what I call naive science) and, at the same time, has retraced steps already taken by others without crediting them (what I call forgetful scholarship).

My next example comes from David Ingram's paper "Phonological rules in young children" (Ingram 1974). Among the topics taken up in Ingram's paper is that of the reduction of consonant clusters by linguistic beginners. He claims to be pointing to a general process of cluster reduction and asserts "the direction of this simplification is consistent across children, even cross-linguistically" (1974:57). His first category is S Reduction, concerning which he states that, in a two-member cluster with /s/ plus consonant or consonant plus /s/, the /s/ is deleted (1974:58). The data on which this very strong claim rests are astoundingly slight; they come from three children, one each learning English, Czech and French. The examples given are three words for the English-speaker, three for the Czech-speaker and one for the French-speaker. Even if there were no contradictory data, this would be an example of science at its most naive. However, it also reveals forgetful scholarship, since, in *Out of the Mouth of Babes*, published two years before the submission of Ingram's article, I discussed the learning of consonant clusters by 54 children, with a sample of more than 1200 tokens, representing 531 cluster types. The data reported there do not confirm Ingram's general rule: in reduced clusters, the /s/ was lost in 8 cases in initial position but retained in 9; it was lost in 8 cases in medial position but retained in 10; it was lost in 4 cases in final position but retained in 5. It is clear that from these data no general rule can be stated about loss of /s/ in clusters reduced by one member; it is about as likely to be lost as to be retained. If there is any tendency at all, it is toward retention, but it is very doubtful that the differences are statistically significant. Had Ingram not suffered from forgetful scholarship, his generalization would still have been premature, but it would at least have been consistent with the known data which, readily available to Ingram, number many more than the seven words on which he apparently bases his general rule. Of course, had he looked at the available data, he could not have made such a general rule; however, he might have been led to some less simplistic formulation which would have been nearer the truth.

My next example comes from D.I. Slobin's "Cognitive prerequisites for the development of grammar". Any seeker after the grail of universals will find much instruction in Slobin's paper. It is a valiant attempt to bring order into the mass of materials gathered in diary studies over the years and Slobin is to be commended for carrying through the task. Because the subject is so important and the results so interesting, it is unfortunate that the work is marred by both naive science and forgetful scholarship. The naive science is displayed in the method of summarizing previous work: i.e., the summaries are in a number of cases labeled "universals", a term that seems to suggest that it applies to "language-everywhere", to use Slobin's phrase. Some of the propositions advanced under the label 'universal' hardly merit that designation (if it is to continue to mean what it appears to mean and what it is alleged to mean). Consider, for example, Slobin's Universal G2: "Errors in choice of functor are always within the given functor class and subcategory". The evidence that led Slobin to this formulation derives from two studies; Miller and Ervin are quoted for English as saying "The children *seldom* used a suffix or function word with the wrong lexical class". This, far from being evidence for the "universal", suggests immediately that it does not hold, since "seldom" implies that there were, in fact, some errors of the type that the "universal" asserts never occur. The other support for the assertion is a paraphrase of Gvozdev to the effect that, although there are confusions about the proper case ending to use in Russian, the child never uses the wrong case . . . he may get the gender or number wrong, but not the case. The Russian child, in this instance was not any Russian child or any sample of Russian children, but specifically Zhenya Gvozdev, the subject of Gvozdev's admirable observations. Unfortunately, both Gvozdev himself and, following him, Slobin, have tended to regard Zhenya as *the* Russian child and to give less attention to the work of other investigators than they perhaps deserve. For example, William Orr Dingwall and Galina Tuniks in their "Government and concord in Russian: a study of developmental psycholinguistics" provide a model of how to draw conclusions from data, as well as presenting experimental data from 28 Russian-speaking children. They report that there is a good deal of case-switching and that, in fact, there is, in their whole sample "but one instance where an error in case-marking accords with . . . [The Gvozdev-Slobin] . . . hypothesis". The Dingwall-Tuniks paper is listed by Slobin in his bibliography and referred to in the body of his paper but the conclusion is inescapable that either he did not read it as carefully as usual or that, having done so, he was overcome by an attack of forgetful scholarship when it came time to revise his paper for inclusion in the Ferguson-Slobin volume. One merit of Slobin's 'universals'. . . they might better be called theorems . . . is that they are formulated precisely enough to be disconfirmed. The Dingwall-Tuniks evidence makes it clear that Universal G2 is, quite simply, false.

Another example . . . I am unsure whether to call it forgetful scholarship or not . . . is found in the recent article by Ferguson and Farwell (1975). The provocative paper makes a pioneering attempt to consider lexical and phonetic factors together in language acquisition and is, as might be expected, full of good things. However, there are some surprises. For example, it is stated (1975:431) that "It does seem from our data that it is often impossible to make well-motivated claims about phonological contrasts in the usual sense at these early stages" and elsewhere the authors state that the reason for this, at least in part, is "the range of variability". Now this very point was one of the major arguments presented in *Out of the Mouth of Babes* where a chapter was devoted to previous studies that claimed to use phonemic analysis in child language studies showing, as gently as possible, that genuine phonemic analysis was impossible because of the way the data were collected, or for other reasons, and a whole chapter was devoted to presenting the range of variability for all the phones collected from 100 children revealing, as was argued there, that phonemic analysis of the developing phonology of children was not a reasonable way to use one's time. It therefore came as a shock to read that Ferguson and Farwell presented the idea as if it had come to them without precedent in the literature. Did Ferguson know of that argument in *Out of the Mouth of Babes*? Evidently he did three years ago, when, in his plenary address in the conference at Florence, he contrasted the various schools of developmental phonology and characterized me as having "abandoned structuralism"[2] in consequence of my point that phones, not phonemes, were the sensible units for analysis in situations where learning was as incomplete as it is in children under four years of age. To be fair to Ferguson and Farwell, one cannot be sure that forgetful scholarship was at work, since they have added a new dimension — that of the varying forms of particular words which they chart through the course of the child's development — so that it is possible that their conclusion was really as "surprising" as they say it was. Whether it was a case of forgetful scholarship or the genuine convergence of great minds at work, I welcome the adherence of two allies as illustrious as Ferguson and Farwell.[3]

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[2] I cheerfully plead guilty; I suppose I must also, when flying the Atlantic, admit to having abandoned swimming.

Naive science in its most extreme form may be seen in the inability . . . or disinclination . . . to anticipate possible alternative explanations for points in one's own theory. All of us are probably guilty of this to some extent, but some cases are egregious. For example, David NcNeill wrestles with the problem of why children around the age of two years or a little older use "telegraphic speech", that is, leave out articles, auxiliary verbs, inflections, and emit utterances like 'where birdie go? what there?' etc. McNeill (1970:20) asserts that the words left out are the least informative in English (whatever that means), and he is puzzled how the child could exclude them systematically without knowing their lack of informativeness: "The only way a child could know whether a word is informative without knowing its syntactic role is by keeping records of the speech he has heard from his parents. Equipped with such records he could discover the frequency with which words are used and so estimate which ones are informative. But this is a vast actuarial undertaking, implausibly vast for a 2-year old, whose exposure to speech is necessarily limited and whose ability to keep unedited records must be small indeed."

This little fantasy of McNeill's suggests two replies: first, since McNeill avoids the problem of language-*learning* by attributing innate ideas to the infant, one is tempted to ask: why swallow the camel of innate universal grammar and yet strain at the gnat of a few uninformative little articles and inflections? The other, more serious, suggestion is one obvious to anyone considering the conditions of learning: the articles, auxiliaries, inflections and others left out are precisely the parts of utterances presented to the child which are almost always unstressed, i.e., the least prominent parts of the stimulus utterance in *loudness*. The parts of the utterances retained at this stage are, in contrast, the loudest parts of the utterances spoken by the parents. Since it is anathema to suggest, in those places where generative theories are developed, that the child might be responding to stimuli in some ordinary learning-theory sense of those terms, or, God forbid, that the child might even imitate some utterances of parental speech, it was no doubt prudent of McNeill not to raise this possibility. In fact, he leaves the question of telegraphic speech and does not return to it, as far as I can discover. This is, in my opinion, a typical example of the extent to which the rigidity of the Chomskyan orthodoxy blocks fruitful speculation and experimentation.

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[3] At the London conference, Ferguson denied being my ally, perhaps to put as much distance as possible between himself and my theory, based as it is on 'secondary reinforcement', a notion he finds not useful. But the question at issue is the recognition, at long last, of the amount of variation in children's usage of phones and of the fact that such variation is great enough to render illusory claims that phonemic analysis is useful with very young children. The facts of variation have nothing to do with my theory. Allies, as diplomatic history reminds us, need not agree on all points. One point is enough.

Time does not permit my adding to these examples, but it might easily be done, including citations from my own works. The general tendency they exemplify is indicative, in my judgment, of the immaturity of developmental psycholinguistics. We will not refute competing theories by ignoring them; to refute them it will be necessary to propose better theories which predict the same data more accurately. Similarly, we will not improve our own theories if we simply elaborate them without considering alternatives and counter-examples already present in the published literature of the field. One of the prime purposes of a conference such as the London conference is, I suppose, to permit the participants to confront each other with anomalies of the kind I have been citing, to the end that the field may be advanced by cooperation as well as competition.

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The Implicational Relation Paradigm in Language Acquisition

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The implicational relation paradigm

During the past decade the study of implicational relations of linguistic phenomena has assumed a place of ever increasing importance in linguistic research. Much of the impetus for this phenomenon can be traced directly to professor Greenberg's fundamental and seminal work on language universals (Greenberg 1963). A great deal of implicational relations research has in fact dealt with attempts to establish implicational universals of the type described by Greenberg (1963:73): "Given x in a particular language, we always find y".

Another related stream of implicational relations research is linked to attempts to bring order and dynamic direction to the description and measurement of linguistic variation. Implicational scaling of linguistic phenomena has been used to describe speech continua (De Camp 1971) and is employed quite widely for the purpose of describing sociological or linguistic constraints on the frequency of application of optional rules (see Wolfram and Fasold 1974:chapters 4 and 5, Bailey and Shuy 1973:*passim*).

The implicational paradigm has not been frequently or systematically applied to the study of variation over time, in other words, in the fields of diachronic linguistics or developmental psycholinguistics. Studies of the successive stages of language acquisition are usually implicational 'by implication' only. They note that certain grammatical features appear in certain sequences. However, a deliberate and overt use of the implicational paradigm would involve statistical determination whether the acquisition of one feature is or at least tends to be the prerequisite for that of another. Such a mode of inquiry is generally not characteristic of language acquisition research, probably most of the research is largely based on case studies and/or relatively small samples and does not lend itself to establishing implicational relations on a statistical basis.

The masculine/feminine pronoun contrast and the agent/patient contrast

Two examples of the application of inquiry into implicational relation will be taken from two second language acquisition studies. The data presented were gathered in a research project recently carried out in the San Francisco Bay Area by the author and his coinvestigator (Chun and Politzer 1975). The research took place in two bilingual schools (School 1: English/Spanish, School 2: English/French). In both schools the second language (L_2 = English for subjects in school 1, L_2 = French for subjects in school 2) was acquired primarily through interaction with classmates and by instruction being carried out in L_2 rather than as a result of formal overt L_2 training.

The data used in this study were gathered through administration of a production test of the type used in Imitation-Comprehension-Production (ICP) tasks frequently employed in first language acquisition research (Slobin 1973): subjects are shown two pictures and listen to two sentences accompanying the pictures. The sentences are differentiated by a minimal grammatical contrast (e.g. Active vs. Passive; Masculine vs. Feminine etc.). Subjects are then asked to reproduce the sentences when cued with the pictures and are scored right or wrong depending only on whether the particular contrast illustrated the pictures is produced correctly as part of their response. The study dealt with a total of fourteen different grammatical contrasts but only data concerning five of them will be reported in this article because they lend themselves to the investigation of a possible implicational relationship. Of these five contrasts, two deal with the Masculine/Feminine construction in pronouns and three with the contrast between agent and patient.

During the experiment four different sentences and four different sets of pictures were used for elicitation of each grammatical contrast. One sample of each pair of sentences is reproduced below.

Subject Pronoun:	*Masculine Singular/Feminine Singular Contrast* He is writing a letter./She is writing a letter. Il écrit une lettre./Elle écrit une lettre.
Object Pronoun:	*Masculine Singular/Feminine Singular Contrast* The dog is biting him./The dog is biting her. Le chien le mord./Le chien la mord.
Active Sentence:	*Agent/Patient Reversal* The truck is pushing the car./The car is pushing the truck. Le camion pousse la voiture./La voiture pousse le camion.

Passive Sentence:	*Agent/Patient Reversal* The girl is hit by the boy./The boy is hit by the girl. La fille est frappée par le garçon./Le garçon est frappé par la fille.
Embedded Relative Clause:	*Agent/Patient Reversal* The boy that the girl hit fell down./The boy that hit the girl fell down. Le garçon que la fille a frappé est tombé./Le garçon qui a frappé la fille est tombé.

The particular implicational relationships for which the data were analysed were the following:

1. Does the mastery of the masculine/feminine contrast in the subject precede the acquisition of the same contrast in the object?
2. Is the agent/patient contrast acquired in the active sentence before it is learned in the passive sentence?
3. Is the agent/patient contrast in the active main clause acquired before it is learned in the embedded relative clause?
4. Is the agent/patient contrast in the passive main clause learned before it is mastered in the embedded relative clause?

Presentation of mean scores

The production tests were administered in both schools to subjects in the kindergarten (Kg), 1st, 3rd, and 5th grades in November of 1974. The tests were also readministered at a later time to all kindergarten subjects. Scores from one of these readministrations (Kg_2) are also reported in our data. At each test administration each subject was given 2 items dealing with each grammatical contrast. Scores were kept in terms of errors. Thus individual scores on each contrast can range from 0 (no errors) to 2 (both items missed).

Mean scores and standard deviations for each test administration are presented in Tables I and II. The graphs show the obvious and expected developmental trend. They also show that, by and large, the mean score distributions appear to support the implicational relations pointed out. With the exception of Kg and grade 5 in school 1 the object pronoun mean error score is higher than the subject pronoun score. For the agent/patient reversal task the mean error score in the passive sentences is generally higher than the score in the active sentence, which in turn is, with one exception (School 1, grade 1), below the error score for the embedded relative clause. However, differences between mean scores at each administration can not by themselves demonstrate an implicational relationship.

TABLE I

MEANS AND STANDARD DEVIATION OF ERROR SCORES
FOR MASCULINE/FEMININE PRONOUN CONTRASTS

Subject Pronoun: Masculine Singular/Feminine Singular

	School 1			*School 2*		
	N	x	S.D.	N	x	S.D.
Kg 1	12	1.42	0.51	14	1.15	0.80
2	12	1.25	0.75	12	1.27	0.90
Grade 1	7	0.43	0.53	11	0.18	0.40
Grade 3	10	0.10	0.32	11	0.18	0.60
Grade 5	12	0.08	0.29	13	0.00	0.00

Object Pronoun: Masculine/Feminine

	School 1			*School 2*		
	N	x	S.D.	N	x	S.D.
Kg 1	12	1.25	0.62	14	1.54	0.66
2	12	1.50	0.52	12	1.64	0.67
Grade 1	7	0.57	0.53	11	0.91	0.83
Grade 3	10	0.50	0.71	11	0.45	0.69
Grade 5	12	0.00	0.00	13	0.08	0.28

The fact that an error mean score for x is higher than for y merely proves that for the subjects as a group y is easier than x. The implicational relationship can be demonstrated only if it is shown that generally only subjects who know y also know x.

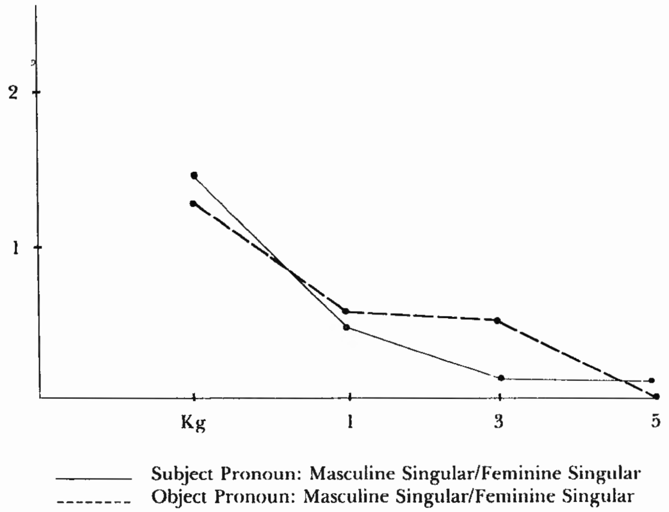
Implicational data analysis

Table III shows the individual error scores (0, 1 or 2) for responses on the Masculine/Feminine pronoun production task. The summary of the same data presented in Table IV indicates quite clearly that in both schools and for most subjects the difficulty of the masculine/feminine contrast is not affected by subject vs. agent function. In school 2 (L_2 = French) there are twenty subjects who performed better with the subject pronoun and only two subjects whose object pronoun score is better than the subject score. In other words, there are only two exceptions (1 in Kg, 1 in grade 3) to an implicational rule that stipulates that the acquisition of the masculine/feminine contrast in the object presupposes or is simultaneous with its acquisition in the subject function. In the case of school 1 (L_2 = English) there are seven exceptions to the implicational rule. Six of these exceptions are found at Kg_1 and Kg_2, one at grade 5. The reason for the large number of exceptions in school 1 lies most likely in the sentence final

GRAPH I

Mean Error Scores for Masculine/Feminine Contrasts by Grade

School 1



School 2

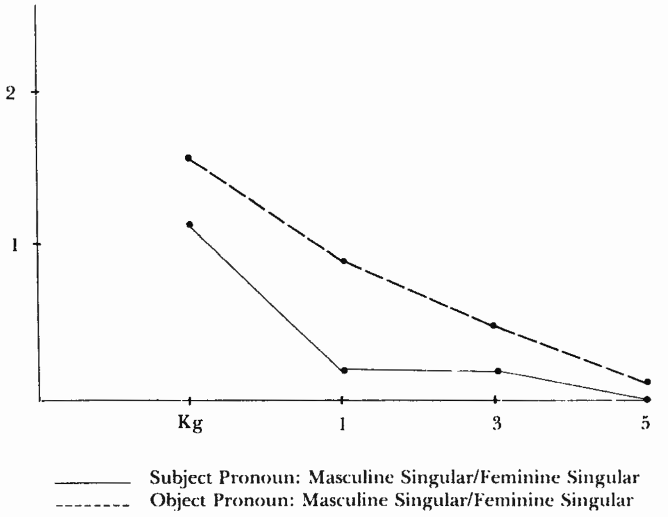


TABLE II

MEANS AND STANDARD DEVIATIONS OF ERROR SCORES FOR AGENT/PATIENT REVERSAL CONTRASTS

Active Sentence: Agent/Patient Reversal

	School 1			*School 2*		
	N	x	S.D.	N	x	S.D.
Kg 1	12	1.42	0.79	14	1.31	0.75
2	12	0.75	0.75	12	0.36	0.67
Grade 1	7	0.57	0.79	11	0.18	0.40
Grade 3	10	0.10	0.32	11	0.18	0.40
Grade 5	12	0.17	0.39	13	0.00	0.00

Passive Sentence: Agent/Patient Reversal

	School 1			*School 2*		
	N	x	S.D.	N	x	S.D.
Kg 1	12	1.83	0.39	14	1.92	0.28
2	12	1.83	0.39	12	1.73	0.65
Grade 1	7	2.00	0.00	11	1.45	0.69
Grade 3	10	1.20	0.92	11	0.36	0.50
Grade 5	12	0.42	0.67	13	0.00	0.00

Embedded Relative Clause: Agent/Patient Reversal

	School 1			*School 2*		
	N	x	S.D.	N	x	S.D.
Kg 1	12	2.00	0.00	14	2.00	0.00
2	12	1.83	0.39	12	2.00	0.00
Grade 1	7	2.00	0.00	11	1.91	0.30
Grade 3	10	1.90	0.32	11	1.91	0.30
Grade 5	12	1.25	0.87	13	1.46	0.78

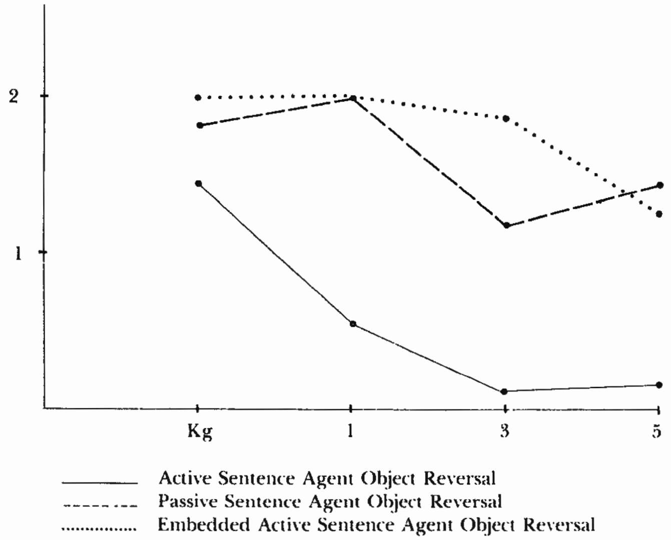
position of the object pronouns *him* and *her* in English. That sentence final position is likely to favor acquisition of any linguistic element is generally recognized (cf. statements of universals in Slobin 1971). In addition, sentence final position may also have facilitated correct recall in the quasi-imitiation task involved in the production test administered to the subjects.

Individual scores and a summary of implicational relations of scores on the production task dealing with the agent/patient contrast are found in Tables V and VI. It will be noted that in each school there are only two exceptions to the implicational rule that scores for the active sentence are equal or better than those in the passive sentence. Both are single mistakes (error scores of 1) made at grade levels at which all other subjects reach

GRAPH II

Mean Error Scores for Agent/Patient Reversal Contrasts by Grade

School 1



School 2

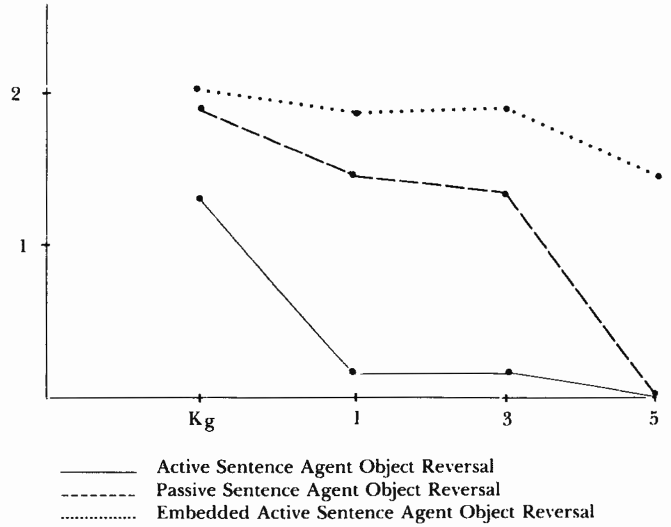


TABLE III

INDIVIDUAL ERROR SCORES FOR MASCULINE/FEMININE PRONOUN CONTRASTS WITH SUBJECT (S) AND OBJECT (O) PRONOUNS

School 1										*School 2*									
Kg 1		*Kg 2*		*1st grade*		*3rd grade*		*5th grade*		*Kg 1*		*Kg 2*		*1st grade*		*3rd grade*		*5th grade*	
S.	O.	S.	O.	S.	O.	S.	O.	S.	O.	S.	O.	S.	O.	S.	O.	S.	O.	S.	O.
1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0
1	1	1	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	0	0
1	1	1	1	1	1	0	0	0	0	1	1	1	2	0	1	0	0	0	0
1	0	1	2	1	1	0	0	0	0	1	1	1	2	0	1	0	0	0	0
1	2	1	2	1	1	0	1	0	0	1	2	2	1	0	1	0	0	0	0
2	1	2	1			0	1	0	0	1	2	2	2	0	2	0	1	0	0
2	1	2	1			0	2	0	0	1	2	2	2	0	2	0	1	0	0
2	2	2	1			1	1	0	0	1	2	2	2	1	1	0	2	0	0
2	2	2	2					0	0	2	2	2	2	1	2	2	1	0	0
	2	2	2					1	0	2	2	2	2					0	0
										2	2							0	0
										2	1								

TABLE IV

SUMMARY OF DISTRIBUTION OF ERRORS IN MASCULINE/FEMININE PRONOUN CONTRASTS

	School 1			*School 2*		
	Subject < *Object*	*Subject* = *Object*	*Subject* > *Object*	*Subject* < *Object*	*Subject* = *Object*	*Subject* > *Object*
Kg 1	1	8	3	7	6	1
2	4	5	3	4	8	0
Grade 1	1	6	0	6	5	0
Grade 3	3	7	0	3	7	1
Grade 5	0	11	1	0	13	0
	9	37	7	20	39	2

> more errors than
< less errors than
= same number of errors as

TABLE V

INDIVIDUAL SCORES FOR AGENT/PATIENT REVERSAL
IN ACTIVE SENTENCES (AS), PASSIVE SENTENCES (PS)
AND EMBEDDED ACTIVE SENTENCE (EAS)

School 1

Kg 1			*Kg 2*			*1st grade*			*3rd grade*			*5th grade*		
AS	PS	EAS	AS	PS	EAS	AS	PS	EAS	AS	PS	EAS	AS	PS	EAS
0	1	2	0	2	2	0	2	2	0	2	2	0	0	2
0	1	2	0	2	2	0	2	2	0	1	2	0	0	1
1	2	2	0	2	2	0	2	2	0	2	1	0	0	0
1	2	2	0	2	2	0	2	2	0	1	2	0	0	0
2	2	2	0	2	1	1	2	2	0	2	2	0	0	1
2	2	2	1	1	2	1	2	2	0	0	2	0	0	0
2	2	2	1	2	2	2	2	2	0	0	2	0	1	0
2	2	2	1	1	1				0	0	2	0	2	2
2	2	2	1	2	2				0	2	2	0	1	2
2	2	2	1	2	2				1	2	2	0	0	1
2	2	2	2	2	2							0	1	2
2	2	2	2	2	2							1	0	2
												1	0	2
						School 2								
0	2	2	0	2	2	0	0	2	0	1	2	0	0	0
0	2	2	0	2	2	0	0	2	0	1	2	0	0	0
0	2	2	0	2	2	0	1	2	0	1	2	0	0	1
1	2	2	0	2	2	0	1	2	0	1	2	0	0	1
1	2	2	0	2	2	0	0	2	0	0	1	0	0	1
1	2	2	0	2	2	0	1	2	0	0	2	0	0	2
1	2	2	0	2	2	0	2	2	0	0	2	0	0	2
1	2	2	0	0	2	0	0	2	0	0	2	0	0	2
2	2	2	0	0	2	0	2	2	0	0	2	0	0	2
2	2	2	0	1	2	1	1	1	1	0	2	0	0	2
2	2	2	1	2	2	1	2	2	1	0	2	0	0	2
2	2	2	1	2	2							0	0	2
2	2	2										0	0	2
2	2	2												

complete mastery (error scores of 0) of the agent/patient contrast in the active sentence. It seems reasonable to account for those exceptions as fortuitous slip-ups rather than true instances disconfirming the implicational pattern.

The agent/patient contrast in the embedded relative clause is obviously much more difficult than the same contrast in the simple main clause. In neither school is there any subject who masters the contrast in the subordinate clause without having reached mastery for the main clause: mastery of the contrast in the subordinate clause implies mastery in the main

TABLE VI

SUMMARY OF DISTRIBUTION OF ERRORS
IN AGENT/PATIENT CONTRAST

	AS < PS	AS = PS	AS > PS	AS < EAS	AS = EAS	AS > EAS	PS < EAS	PS = EAS	PS > EAS
School 1									
Kg 1	4	8	0	4	8	0	2	10	0
2	8	4	0	9	3	0	1	10	1
Grade 1	6	1	0	6	1	0	0	7	0
Grade 3	7	3	0	10	0	0	5	4	1
Grade 5	4	7	1	9	4	0	8	4	1
Total	29	23	2	38	16	0	16	35	3
School 2									
Kg 1	6	8	0	8	6	0	2	12	0
2	10	2	0	12	0	0	3	9	0
Grade 1	7	4	0	10	1	0	7	4	0
Grade 3	4	5	2	11	0	0	11	0	0
Grade 5	0	13	0	11	2	0	11	2	0
Total	27	32	2	52	9	0	34	27	0

> more errors than
< less errors than
= same number of errors as

clause. As a matter of fact, the embedded relative clause poses also much greater difficulty than the main clause passive sentences. As can be seen in Table VI, there are only three scattered exceptions (all in school 1) to the rule that makes mastery in the passive main clause a condition for achievement in the active embedded relative clause.

Interpretation and discussion of findings

In general the results of the data analysis correspond to expectations. The relative difficulty of pronoun contrasts and agent/patient distinctions attested by our findings corresponds to those obtained by other researchers using similar instruments for research concerning first language acquisition (Fraser, Bellugi and Brown 1963) or the simultaneous acquisition of two languages by bilinguals (Kessler 1971). To what extent the similarity between second and first language acquisition results justifies the assumption of an underlying similarity or perhaps even identity (cf.

Dulay and Burt 1974a, 1974b) of first and second language acquisition processes, is a highly debatable question. Detailed discussion of this problem goes beyond the scope of this article. Obviously, the similarity of findings can be partly at least accounted for by the fact that the relative difficulties of the production tasks under discussion are influenced by factors relating to perception, memory and language processing constraints which would be present for first as well as second language learners: the difficulty experienced with embedded relative clauses can be expected not only because of the relatively greater length of the utterance but also on account of the uneven and interrupted sequence in which the semantic information is supplied. A similar factor, namely 'semantic compression' (the 'bunching' of information in the verb phrase of the sentence) has been suggested as the source of the greater difficulty in the production and comprehension of the passive as opposed to the active (Smith 1970). Identical difficulties inherent in first and second language acquisition tasks do not necessarily imply identity in the acquisition process, though strong underlying similarity between the processes seems a reasonable hypothesis (cf. Erwin-Tripp 1974).

The investigation of implicational relationships of the acquisition of specific grammatical features of a second language occurring in a relatively unstructured 'natural' context (as opposed to one in which the sequence of acquisition is governed by a teacher and/or a textbook) has also some rather obvious pedagogical implications. Sequencing of grammatical structures in textbooks usually follows pedagogical intuitions which are typically based on the assumption that elements should be presented in an order of increasing difficulty or complexity. Implicational studies of what structures presuppose others in uncontrolled second language learning situations may make it possible to replace intuitions about complexity by empirical evidence.

Advantage of the use of the implicational research paradigm

ICP instruments of the type discussed in this article could be used with relatively large samples of first and second language learners for the specific purpose of establishing which constructions or groups of constructions are implicationally related in acquisition processes. Implicational analysis has the advantage of preserving the data dealing with the individual subject. At the same time the gathering of data through specific instruments is less time consuming than individual case studies. Implicational analysis of group data obtained from cross sectional administration of tests must, of course, be supplemented with longitudinal case studies in which language development is observed in more natural communication situations, in order to avoid biases that may be introduced by the test as well as the cross sectional nature of the research design (cf. Rosansky 1976).

The establishment of universals of either first or second language acquisition is still in its early stages. First language acquisition universals discussed so far (Slobin 1971) deal primarily with perceptual strategies like 'paying attention to word order', 'avoiding interruptions of linguistic units', etc. The existence of second language acquisition universals appears to be a very doubtful proposition at least as far as the linear sequence of acquisition of grammatical features is concerned (Hatch 1974). For the field of second language the suggestion has been made (Dulay and Burt 1974c) that the speculation concerning language acquisition universals may be premature and should be replaced by empirical studies establishing the hierarchies of groups of linguistic features implicationally related in the acquisition process. Dulay and Burt's approach is based on a paradigm 'x is a prerequisite for y'. However, they do not use the term 'implicational' nor do they suggest the implicational research paradigm used in sociolinguistics but rather an ordering-theoretic method (Bart and Krus 1973).

There is, however, no basic difference between the goals suggested by Burt and Dulay and the implicational analysis advocated in this article. At any rate, we can hope that implicational analysis of first and second language acquisition processes may some day lead to the establishment of first and second language acquisition universals: complex, implicational and empirically validated universals of the type envisaged by professor Greenberg.

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The Geographical and Genetic Distribution of Linguistic Features

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1. Introduction

The present study is a preliminary attempt to delineate the geographical and genetic distribution of certain linguistic features among the world's languages. By linguistic features I mean simply characteristics of human languages such as a voice contrast among the stop consonants, nasal vowels, tone, or the word order SOV in the simple declarative sentence. Many, if not all, of the areal characteristics discussed here have been recognized elsewhere in the extensive literature on areal linguistics; I have not attempted, however, to document each generalization.

This study is based on a sample of 693 languages,[1] the geographical and genetic affiliation of which are indicated in Table I:

TABLE I: LANGUAGE SAMPLE

Area	*Language family*	*Number of languages in sample*
AFRICA	Afro-Asiatic	29
	Niger-Kordofanian	51
	Nilo-Saharan	25
	Khoisan	4
EUROPE	Indo-European	73
	Caucasian	37
	Uralic	23
ASIA	Altaic	39
	Paleosiberian	8
	Dravidian	10
	Sino-Tibetan	18
	Austro-Asiatic	17

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[1] A list of the languages utilized, the linguistic information for each language, and the source of that information may be found in Ruhlen (1975).

OCEANIA	Indo-Pacific	50
	Australian	24
	Austro-Tai	67
NORTH AMERICA	Eskimo-Aleut	5
	Na-Dene	12
	Macro-Algonquian	13
	Salish	10
	Wakashan	2
	Macro-Siouan	12
	Penutian	43
	Hokan	19
	Aztec-Tanoan	15
	Oto-Manguean	14
SOUTH AMERICA	Macro-Chibchan	10
	Ge-Pano-Carib	24
	Andean-Equatorial	39

The correlation between language family (or stock) and geographical area is of course only approximate in that several families spill over from one continent to another. Except for a few Afro-Asiatic languages spoken in the Middle East, the languages of all four African families are spoken entirely within Africa. Both the Indo-Iranian branch of Indo-European and the Samoyedic branch of Uralic are located in Asia. All of the Asian families are confined to Asia proper. With the exception of the Kam-Tai branch of Austro-Tai, the Oceanic languages are restricted to Oceania; the Kam-Tai languages (e.g., Thai, Lao) are spoken in Southeast Asia. Practically all the languages of the ten North American families are confined to North America. Eskimo and Aleut are also used in Asia, while two Penutian languages (Araucanian and Chipaya) are spoken in South America. Except for several Macro-Chibchan languages situated in Central America, all three South American phyla are restricted to South America proper. In general, then, letting certain language families represent major geographical regions provides a reasonably accurate approximation to the geographical distribution of linguistic features. Nevertheless, from time to time (cf. Tables VII, XI, XIII, XV, XVII, XXI, XXV) some languages or groups of languages will be shifted to the geographical region where they truly belong, and mention will be made of this fact.

Clearly the language sample is weighted more towards some geographical areas and language families than others. This is partially because certain areas of the world (and certain language families) contain more languages than other parts (or other families). Secondly, the languages of some regions are much better described in the literature. It remains to be seen how truly representative of the world's languages the present sample is.[2]

[2] For an intriguing discussion of language sampling, see Sherman (1975).

It is well known that the same sound may function differently in different languages. In language A, [ŋ] may be an independent phoneme capable of distinguishing lexical items, while in language B, [ŋ] occurs only before the velar stops *k* and *g* as a conditioned allophone of /n/ (or perhaps /N/). Thus, although both A and B have the phone [ŋ], only A has the phoneme /ŋ/. In dealing with the geographical distribution of various types of phonological segments we will in *all* cases restrict our discussion to the phonemic rather than the phonetic inventory of a language. Specifically, the segment inventory of each language in our sample consists of the chief ('elsewhere') allophone for each (classical) phoneme. The voiceless stops of English, for example, are considered to be /pʰ, tʰ, kʰ/ rather than /p, t, k/, since the former represent the 'normal' sound in English, the aspiration of which may be conditionally suppressed in specific environments (e.g., after *s*, word finally). Certainly the *phonetic* distribution of various segment types will be (to an undetermined extent) broader than the *phonological* distribution which forms the subject of our investigation.

Although it is in most instances obvious which allophone is basic and which conditioned, there are cases where such a choice is difficult to make. The limitations of our approach should therefore be borne in mind throughout the discussion.

2. Consonants

All languages possess consonants and vowels, but the particular kinds vary from language to language. Certain categories (e.g., stop, nasal), and even segments (e.g., *a*, *t*, *n*), are virtually universal, while other categories (e.g., implosive, click) and segments (*ỹ*, *k͡p*) are less widely attested in the world's languages.

Stops. All the languages in our sample have stops.[3] Almost all languages have stops made at the bilabial, apical, and velar points of articulation; Tahitian and Chavante lack velar stops, Hawaiian and (the closely related) Luanguia lack dental stops, and a number of languages (e.g., Aleut, Cherokee, Oneida, Tlingit, Waiwai) have no bilabial stops. Numerous languages have, in addition, glottal, palatal, uvular, or retroflex stops. A few languages (e.g., Tamil, Maung, Nez Perce) oppose dental and alveolar stops.

Glottal stop [ʔ] occurs in roughly half the languages, uvular stops [q, ɢ] in 20% of the sample, while labial-velars [k͡p, g͡b] are found in only 6%. [ʔ] is common throughout the world, but is relatively rare in certain families. Although [k͡p, g͡b] characterize 71% of the Niger-Kordofanian languages, they are practically nonexistent elsewhere. Four Nilo-Saharan languages

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[3] See the Appendix for the distribution, according to language family, of each feature discussed.

(Mangbetu, Mamvu, Logbara, Moru) located on the northeastern border of the Niger-Kordofanian family, one Indo-European language (Saramaccan, an English-based Creole spoken by 'Bush Negroes' in Surinam), and one Indo-Pacific language (Yupna) spoken in New Guinea are also reported to have labial-velars. Like clicks, [k͡p, g͡b] are virtually restricted to Africa.

Prenasalization of stop consonants occurs in 10% of the language sample (68/693), but these languages are found chiefly in Africa and Oceania. Two Asian languages, seven North American languages, and two South American languages also have prenasalized stops. In Africa, 26% of the languages (28/109) have prenasalized stops, while in Oceania the figure is 22% (31/141). Ignoring other factors which affect systems of stops (e.g., aspiration, glottalization, length, palatalization, labialization) and focusing on the features of voicing and prenasalization, there are eight ways in which prenasalization may interact with voicing. Of these eight systems, two are common, two are rare, and four are unattested, as Table II shows.

TABLE II: PRENASALIZED STOPS

	System	*Languages in Sample*
1	p, ^{m}b	31
2	p, b, ^{m}b	30
3	p, ^{m}p, b, ^{m}b	5
4	p, ^{m}p, b	2
5	^{m}p, b	0
6	^{m}p, ^{m}b	0
7	p, ^{m}p, ^{m}b	0
8	^{m}p, b, ^{m}b	0

In both of the common systems prenasalization affects the voiced stop, either in contrast to another voiced stop which is not prenasalized (2), or in addition to the voicing feature itself (1). In the rare systems a prenasalized voiceless stop contrasts with a plain voiceless stop (4), or both the voiced and voiceless stops have prenasalized pertners (3). Three of the four unattested systems involve a prenasalized voiceless stop without a plain voiceless one (5, 6, 8). The affinity between prenasalization and voicing is evident in Table II.

Seventy-two percent of the languages in our sample exhibit a voice contrast in the stops (i.e., /p, t, k/ vs. /b, d, g/). Although a voice contrast is quite common everywhere in the world, it is nonetheless more frequent in Africa, Europe, and Asia than it it is Oceania and the New World:

TABLE III: VOICE CONTRAST IN STOPS

Africa	106/109 = 97%
Europe	123/133 = 92%

Asia	77/92 = 84%
Oceania	89/141 = 63%
North America	67/145 = 46%
South America	39/73 = 53%
Total	501/693 = 72%

An aspiration contrast among the voiceless stops (i.e., /p, t, k/ vs. /pʰ, tʰ, kʰ/) is much less prevalent than a voice contrast, but it still enjoys a wide geographical distribution, with highest concentration in Asia:

TABLE IV: ASPIRATION CONTRAST IN STOPS[4]

Africa	6/109 = 6%
Europe	16/133 = 12%
Asia	30/92 = 33%
Oceania	11/141 = 8%
North America	18/145 = 12%
South America	12/73 = 16%
Total	93/693 = 13%

Affricates. With the exception of Australia in particular, and Oceania in general, affricates are widely attested everywhere in the world:

TABLE V: AFFRICATES

Africa	65/109 = 60%
Europe	115/133 = 86%
Asia	75/92 = 82%
Oceania	39/141 = 28%
North America	131/145 = 90%
South America	57/73 = 78%
Total	482/693 = 70%

The relative dearth of phonemic affricates in Australia (2/24 = 8%) is no doubt related to the lack of fricatives in those languages,[5] and is just one of several phonological eccentricities characterizing Australian languages.

Fricatives. Except in Oceania, almost all of the world's languages have one kind of fricative or another. Only 36 of the 693 languages in our sample lack fricatives altogether. Of these 36 languages, one is found in Africa, three in South America, and the remaining 32 in Oceania (22 in Australia, seven in New Guinea, two on Bougainville, and one on the Gilbert Islands):

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[4] If the Indo-European languages spoken in Asia were counted with the other Asian languages — rather than with the European languages as we have done — then the European percentage would fall to 5%, though the Asian figure would remain essentially the same.

[5] Cf. Jakobson (1968:55): "A so-called half-stop consonant (or affricate) . . . is acquired by the child only after the fricative of the same series."

TABLE VI: FRICATIVES

Africa	108/109 =	99%
Europe	133/133 =	100%
Asia	92/92 =	100%
Oceania	109/141 =	77%
North America	145/145 =	100%
South America	70/73 =	96%
Total	657/693 =	95%

One of the prime reasons for the strength of the category 'fricative' is the almost equal strength of the subcategory 'sibilant' (i.e. s, ṣ, š, ṣ̌):

TABLE VII: SIBILANTS[6]

Africa	105/109 =	96%
Europe	133/133 =	100%
Asia	87/93 =	94%
Oceania	95/140 =	68%
North America	144/144 =	100%
South America	63/74 =	85%
Total	627/693 =	90%

Only 66 languages in our sample lack sibilants, and 45 of these are found in Oceania (all 24 Australian languages, 13 Indo-Pacific languages on New Guinea and Bougainville, and nine Austro-Tai languages, including five Polynesian). Four African, six Asian, and 11 South American languages also lack sibilants.

Another widely dispersed category of fricatives, the glottals [h,ɦ], are commonplace everywhere but Australia. Slightly under two-thirds of the African, European, and Asian languages use glottal fricatives, while the percentage is considerably lower in Oceania (especially among Australian [0/24] and Indo-Pacific [17/50] languages), and markedly higher in the New World:

TABLE VIII: GLOTTAL FRICATIVES

Africa	66/109 =	61%
Europe	87/133 =	65%

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[6] In Table VII, Lakkia, an Austro-Tai language spoken in South China, and Araucanian, a Penutian language spoken in Chile — both of which lack sibilants — have been included under Asia and South America, respectively.

Asia	57/92 = 62%
Oceania	60/141 = 43%
North America	117/145 = 81%
South America	58/73 = 79%
Total	445/693 = 64%

Pharyngeal fricatives [ħ, ʕ] are probably the rarest type of fricative; they are characteristic of (some) Afro-Asiatic and Caucasian languages, but are scarce elsewhere:

TABLE IX: PHARYNGEAL FRICATIVES[7]

Africa	14/109 = 13%
Europe	25/133 = 19%
Asia	3/92 = 3%
Oceania	1/141 = 1%
North America	4/145 = 3%
South America	1/73 = 1%
Total	48/693 = 7%

Nasals. After stops, which are used in every human language, nasal consonants (m, n, ṇ, ñ, ŋ, ɴ) come closer to universality than any other consonant type. Except for two Salish languages (Twana and Puget Sound Salish) and one South American language (Mura), every language in our sample has nasal consonants. Furthermore, both Salish languages possess *m* and *n* as marginal speech sounds. Thompson and Thompson (1972) present a thorough discussion of languages lacking nasal consonants, and Crothers (1975) investigates nasal consonant systems cross-linguistically.

Laterals. Laterals occur commonly in languages around the world. They are, nevertheless, often absent in Oceanic (particularly Indo-Pacific) and South American languages:

TABLE X: LATERALS

Africa	97/109 = 89%
Europe	133/133 = 100%
Asia	88/92 = 96%
Oceania	103/141 = 73%
North America	123/145 = 85%
South America	22/73 = 30%
Total	566/693 = 82%

---

[7] It is not uncommon in the linguistic literature for the term 'pharyngeal' to be used to denote the glottal fricative *h*; it would, therefore, not be surprising if some of the pharyngeal fricatives listed in Table IX were really glottal fricatives.

Vibrants. I include in the class of vibrants those sounds represented in the literature by various kinds of '*r*'s' (e.g., r, ɾ, ṛ, ʀ, ɹ, ɹ̣). In one direction vibrants impinge on laterals, with which they form the class of liquids (see below); many languages have a single liquid segment which has a lateral allophone in some environments and a vibrant allophone in others (e.g., Japanese). Other languages have a single liquid which has characteristics of *both* a lateral and a vibrant; thus, the only liquid in Gahuku, Pima, Wayana, and Cubeo is a lateral flap. In another direction, vibrants run into the class of fricatives; the IPA phonetic alphabet recognizes this area of ambiguity in representing voiced alveolar and uvular fricatives with symbols: [ɹ] and [ʁ], respectively.

Vibrants are frequent everywhere, but the percentage of languages without vibrants is much higher in North America than anywhere else in the world:

TABLE XI: VIBRANTS[8]

Africa	97/109 =	89%
Europe	131/131 =	100%
Asia	76/92 =	83%
Oceania	106/141 =	75%
North America	65/145 =	45%
South America	61/75 =	81%
Total	536/693 =	77%

Liquids. Although 127 languages in our sample lack laterals and 157 lack vibrants, only 32 languages lack both. That is, only 5% of the languages lack liquids altogether:

TABLE XII: LIQUIDS

Africa	108/109 =	99%
Europe	133/133 =	100%
Asia	92/92 =	100%
Oceania	133/141 =	94%
North America	130/145 =	90%
South America	65/73 =	89%
Total	661/693 =	95%

All but one (Efik) of the liquidless languages are found in Oceania (the Indo-Pacific phylum), North America (chiefly the Central Algonquian and Siouan languages), or South America.

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[8] Saramaccan and Djuka, both English-based creoles spoken in Surinam, are counted under South America in Table XI.

Approximately two-thirds of the languages have *both* laterals and vibrants, but this figure shows marked geographical variation, ranging from 100% in Europe to only 25% in South America:

TABLE XIII: LANGUAGES WITH *BOTH* LATERALS AND VIBRANTS[9]

Africa	86/109 = 79%
Europe	131/131 = 100%
Asia	73/92 = 79%
Oceania	76/141 = 54%
North America	58/145 = 40%
South America	19/75 = 25%
Total	443/693 = 64%

Bhat (1974) contains an extensive investigation of the phonology of liquid consonants.

Long Consonants. Because long consonants are very often treated as sequences of two identical short consonants, they are easy to overlook in the literature. It is to be expected, therefore, that the actual incidence of long consonants is higher than Table XIV suggests:

TABLE XIV: LONG CONSONANTS

Africa	29/109 = 27%
Europe	37/133 = 28%
Asia	13/92 = 14%
Oceania	7/141 = 5%
North America	10/145 = 7%
South America	1/73 = 1%
Total	97/693 = 14%

Length is contrastive in consonants most often in African and European languages; it is least often so in Oceania and the New World.

Retroflex Consonants. Retroflex consonants, typical of most languages on the Indian subcontinent and in Australia, are found with low frequency in all parts of the world:

TABLE XV: RETROFLEX CONSONANTS[10]

Africa	16/109 = 15%
Europe	5/107 = 5%

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[9] Saramaccan and Djuka are counted under South America in Table XIII.

[10] In Table XV, the Indo-Iranian branch of Indo-European has been counted under Asia.

Asia	36/118 = 31%
Oceania	32/141 = 23%
North America	23/145 = 16%
South America	19/73 = 26%
Total	131/693 = 19%

Whereas in India and Australia a single language may have retroflex stops, fricatives, nasals, laterals, and vibrants, in other areas languages possess only a single retroflex segment. For an interesting cross-linguistic study of retroflexion, see Bhat (1973).

Clicks. As normal speech sounds, clicks are found *only* in Southern Africa, primarily in the Khoisan family. Apparently all Khoisan languages have a series of clicks, and these sounds have been borrowed by several neighboring Bantu languages, of which Zulu is the only example in our sample. It is nevertheless worth mentioning that clicks occur in many languages as 'interjections,' that is, a sound with a specific meaning. Although phonologists generally do not accord too much attention to such marginal speech sounds (so that their incidence in the world's languages is probably much higher than the literature would lead one to believe), at least six languages in our sample use clicks as interjections (Luo, English, Rumanian, Asmat, Auca, and Jivaro).

Ejectives. 'Glottalized' consonants are variously described in the literature, and ejection or implosion is often not explicitly mentioned. I have therefore grouped voiceless postglottalized segments with the ejectives, and voiced preglottalized segments with the implosives. This is not to deny the very real phonetic differences between various kinds of 'glottalized' consonants.[11] Greenberg (1970) presents an extensive cross-linguistic investigation of glottalized consonants.

Ejectives are found in 11 African languages (primarily in the Northeast and South), all 37 Caucasian languages plus one Indo-European neighbor (Ossetic) in the Caucasus, throughout North America, particularly along the Northwest Coast, from Alaska to California, and in Southern Mexico. In Europe (except the Caucasus), Asia, Oceania, and most of Africa and South America ejectives rarely occur:

TABLE XVI: EJECTIVES

Africa	11/109 = 10%
Europe	38/133 = 29%
Asia	2/92 = 2%

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[11] Cf. Ladefoged (1964).

Oceania	3/141 = 2%
North America	69/145 = 48%
South America	6/73 = 8%
Total	129/693 = 19%

Implosives. Implosives are an areal characteristic of Sub-Saharan Africa, Southeast Asia, and Southern Mexico; elsewhere they appear sporadically, if at all:

TABLE XVII: IMPLOSIVES[12]

Africa	38/109 = 35%
Europe	1/132 = 1%
Asia	5/93 = 5%
Oceania	5/141 = 4%
North America	15/145 = 10%
South America	4/73 = 5%
Total	68/693 = 10%

Like labial-velars and clicks, implosives are an outstanding trait of Sub-Saharan languages. In Southeast Asia they occur in both Austro-Tai and Austro-Asiatic languages, while in Southern Mexico they are found in one Oto-Manguean and 13 Mayan languages.

3. Vowels

The most common pattern for non-long oral vowels is the five-vowel system of Classical Latin:

(1)
i u
e o
a

Slightly more than a quarter of the languages in our sample exhibit this pattern, which is prevalent in all parts of the world:

i u
TABLE XVIII: e o VOWEL PATTERN
a

Africa	21/109 = 19%
Europe	30/133 = 23%
Asia	20/92 = 22%
Oceania	57/141 = 40%

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[12] In Table XVII Sindhi, an Indic Language of Pakistan, has been counted under Asia.

North America	48/145 = 33%
South America	11/73 = 15%
Total	187/693 = 27%

Furthermore, three common variants of (1) account for another 18% of the sample. The Latin system plus schwa:

(2) i u
e ə o
a

is found in 7% (47/693) of the languages; the basic vowel triangle:

(3) i u
a

occurs in 6% (40/693) of the sample; and the Italian system:

(4) i u
e o
ɛ ɔ
a

in another 6% (41/693). Thus, only four patterns account for almost half of the vowel systems.

Front Rounded Vowels. The vowel systems of virtually all languages contain front unrounded and back rounded vowels.[13] In addition, some languages also possess front rounded (y, ø,œ) and/or back unrounded vowels (ɯ, ɤ, ʌ). Front rounded vowels occur in 12% of the languages in our sample, but 90% of these languages are located in Europe or Asia:

TABLE XIX: FRONT ROUNDED VOWELS

Africa	3/109 = 3%
Europe	40/133 = 30%
Asia	32/92 = 35%
Oceania	4/141 = 3%
North America	1/145 = 1%
South America	0/73 = 0%
Total	80/693 = 12%

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[13] Several Caucasian languages (e.g., Abkhazian, Circassian) are exceptions to this generalization.

Back Unrounded Vowels. Back unrounded vowels are slightly less common than front rounded vowels, but their geographical distribution differs markedly:

TABLE XX: BACK UNROUNDED VOWELS

Africa	2/109 = 2%
Europe	6/133 = 5%
Asia	28/92 = 30%
Oceania	5/141 = 4%
North America	10/145 = 7%
South America	15/73 = 21%
Total	66/693 = 10%

While most languages with back unrounded vowels also possess back rounded vowels, in South America it is not unusual for a language to have either [ɯ] or [ɤ] without the corresponding rounded vowel (i.e., [u], [o], respectively).

Nasal Vowels. Nasal vowels occur frequently in Sub-Saharan Africa (except the northeastern portion), Northern India, central Mexico, and South America. They are less prevalent in Europe, the Caucasus, Southeast Asia (including China), and North America. Nasal vowels are apparently quite rare in North and East Africa, North Asia, Australia and Oceania:

TABLE XXI: NASAL VOWELS[14]

Africa	32/109 = 29%
Europe	23/107 = 21%
Asia	22/118 = 19%
Oceania	4/141 = 3%
North America	35/145 = 24%
South America	38/73 = 52%
Total	154/693 = 22%

A detailed investigation of nasal vowels, from the perspective of language universals, is contained in Ruhlen (to appear).

Long Vowels. Long vowels are found in roughly half of the African, European, Asian, and Oceanic languages in our sample. They are most common in North America, and least common in South America:

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[14] In Table XXI, the Indo-Iranian languages have been counted under Asia.

TABLE XXII: LONG VOWELS

Africa	55/109 = 50%
Europe	61/133 = 46%
Asia	49/92 = 53%
Oceania	61/141 = 43%
North America	90/145 = 62%
South America	19/73 = 26%
Total	335/693 = 48%

4. Suprasegmentals

Like many segmental features investigated in sections 2 and 3, the suprasegmental features of tone and vowel harmony exhibit a skewed geographical distribution.

Tone. Although roughly a quarter of the languages in our sample are tonal, this figure ranges from a high of 92% in Sub-Saharan Africa to a low of 5% in Europe

TABLE XXIII: TONE

Africa	76/109 = 70%
Europe	7/133 = 5%
Asia	22/92 = 24%
Oceania	21/141 = 15%
North America	28/145 = 19%
South America	10/73 = 14%
Total	164/693 = 24%

Vowel Harmony. Over half of the languages with vowel harmony belong to either the Uralic or Altaic family. Various types of vowel harmony are also common in Africa, and sporadic in Oceania and the New World:

TABLE XXIV: VOWEL HARMONY

Africa	24/109 = 22%
Europe	19/133 = 14%
Asia	33/92 = 36%
Oceania	2/141 = 1%
North America	3/145 = 2%
South America	3/73 = 4%
Total	84/693 = 12%

Ultan (1973) examines vowel harmony from a cross-linguistic perspective.

5. Word Order

As examples of grammatical features we have examined the order of the subject, verb, and object in a sentence, and the order of a noun and modifying adjective in a noun phrase.

Subject-Verb-Object. As first pointed out in Greenberg (1963), of the six possible orders for subject (S), verb (V), and object (O) (in declarative sentences with nominal subject and object) only three usually appear in the world's languages: SOV, SVO, and VSO. Our sample contained information on the order of the subject, verb, and object in 406 languages. The most frequent order, found in about half the languages, was verb-final. Verb-medial was somewhat less common (37%), and verb-initial the least frequent of all (11%):

TABLE XXV: SENTENCE WORD ORDER[15]

	SOV	*SVO*	*VSO*
Africa	22/82 = 27%	50/82 = 61%	10/82 = 12%
Europe	30/83 = 36%	51/83 = 61%	3/83 = 4%
Asia	87/102 = 85%	14/102 = 14%	0/102 = 0%
Oceania	50/83 = 60%	17/83 = 20%	16/83 = 19%
North America	10/36 = 28%	15/36 = 42%	11/36 = 31%
South America	11/20 = 55%	5/20 = 25%	4/20 = 20%
Total	210/406 = 52%	152/406 = 37%	44/406 = 11%

Sub-Saharan Africa has predominantly SVO order in all but the northeastern portion, where both SOV and VSO are found. In North Africa and the Middle East we find VSO alternating with SVO. Except for Basque on the Iberian Peninsula (which is SOV), and the Celtic languages in Ireland, Wales, and Northwestern France (which are VSO), most of Europe is solidly SVO. The order SOV is, however, common on the eastern fringe of Europe in a number of Caucasian and Uralic languages. The dominant order in Asia is SOV, though Southeast Asia (including China) appears to prefer SVO. In Oceania both Australia and New Guinea are overwhelmingly SOV, while the Philippines and Polynesia favor VSO. Elsewhere in Oceania both SVO and VSO are encountered. Since our sample has relatively few North and South American languages, general patterns of distribution are difficult to discern. Nevertheless, in North America we can point to a number of verb-initial languages on the Northwest Coast and in Southern Mexico and Guatemala. In much of North America SOV and SVO both occur. Our data on South America are scant, but seem to indicate a preference for the verb-final pattern.

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[15] In Table XXV, the Indo-Iranian languages have been counted under Asia.

Eleven languages in our sample have a basic order other than the three common types shown in Table XXV. Eight languages apparently have the order VOS (Malagasy, Batak, Gilbertese, Chol, Pocomchi, Tzeltal, Chontal, and Mazatec) and one language (Mamvu), OSV. In addition, two languages have VOS alternating with OVS (Coos and Siuslaw).

Adjective-Noun. An adjective (A) modifying a noun (N) may either precede (AN) or follow (NA) it. Each pattern occurs in half the languages in our sample. Africa and Oceania generally favor the order NA, while in Europe and Asia AN is most common. Both orders seem to be of roughly equal frequency in North and South America, though a larger sample here would be desirable:

TABLE XXVI: NOUN PHRASE WORD ORDER

	NA	*AN*
Africa	66/78 = 85%	12/78 = 15%
Europe	23/106 = 22%	83/106 = 78%
Asia	10/75 = 13%	65/75 = 87%
Oceania	64/71 = 90%	7/71 = 10%
North America	19/38 = 50%	19/38 = 50%
South America	12/19 = 63%	7/19 = 37%
Total	194/387 = 50%	193/387 = 50%.

6. Conclusion

This study has investigated the geographical and genetic distribution of a number of linguistic features, both phonological and grammatical. Although certain features are universal, or nearly so, others exhibit a sharply skewed geographical and/or genetic distribution. Stops, fricatives, nasals, and liquids occur in the vast majority of the world's languages, while clicks, labial-velars, pharyngeal fricatives, and front rounded vowels are relatively rare. In between these two extremes we encounter features such as affricates, long vowels, and the SOV word order, which occur in a sizeable proportion, but by no means all, of the world's languages.

It is obvious of course that the most widely distributed features are those which linguists have traditionally considered the 'simplest,' while the rarest features are those which are in some sense 'complex.' Another way of looking at the question is in terms of hierarchical structure, where all languages are forced to use the basic elements of the hierarchy, but each language is then free to embellish the common pattern in a variety of ways. A third way of viewing the synchronic distributional patterns sketched in this paper is in terms of diachrony. If clicks, for example, are exceedingly rare, we may interpret this to mean that the diachronic process (or, more likely, series of individual processes) which produces them depends on a set of variables which seldom co-occur in human language. On the other hand, the common appearance of long vowels or voiced stops in languages around the world is certainly due to the high frequency of the phonological processes which create them. Finally, we might remark that even in languages without phonemic long vowels or voiced stops, such features are frequently lurking just below the phonemic surface, waiting to make their appearance should the appropriate set of changes take place. This is not true of clicks, labial-velars or pharyngeal fricatives, which are usually absent from the allophony as well as from the phonemics of a language.

There are certainly other ways of interpreting the distributional patterns found in human language (e.g., child language acquisition, language contact). It seems reasonable, however, to follow Jakobson in considering all such perspectives as merely different facets of the same underlying phenomenon. Furthermore, it is likely that different modes of research will be fruitful in arriving at a deeper understanding of the geographical and genetic distribution of linguistic features, and it is toward that end that the empirical evidence of the present study is offered.

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Appendix

	Stops	ʔ	q/ɢ	k͡p/g͡b	*Prenasalized Stops*
AFRO-ASIATIC	29/29 = 100%	23/29 = 79%	11/29 = 38%	0/29 = 0%	4/29 = 14%
NIGER-KORDOFANIAN	51/51 = 100%	7/51 = 14%	1/51 = 2%	36/51 = 71%	13/51 = 25%
NILO-SAHARAN	25/25 = 100%	7/25 = 28%	0/25 = 0%	4/25 = 16%	9/25 = 36%
KHOISAN	4/4 = 100%	3/4 = 75%	0/4 = 0%	0/4 = 0%	0/4 = 0%
INDO-EUROPEAN	73/73 = 100%	3/73 = 4%	10/73 = 14%	1/73 = 1%	1/73 = 1%
CAUCASIAN	37/37 = 100%	32/37 = 86%	37/37 = 100%	0/37 = 0%	0/37 = 0%
URALIC	23/23 = 100%	4/23 = 17%	1/23 = 4%	0/23 = 0%	0/23 = 0%
ALTAIC	39/39 = 100%	5/39 = 13%	7/39 = 18%	0/39 = 0%	0/39 = 0%
PALEOSIBERIAN	8/8 = 100%	6/8 = 75%	8/8 = 100%	0/8 = 0%	0/8 = 0%
DRAVIDIAN	10/10 = 100%	1/10 = 10%	0/10 = 0%	0/10 = 0%	0/10 = 0%
SINO-TIBETAN	18/18 = 100%	8/18 = 44%	1/18 = 6%	0/18 = 0%	1/18 = 6%
AUSTRO-ASIATIC	17/17 = 100%	11/17 = 65%	0/17 = 0%	0/17 = 0%	1/17 = 6%
INDO-PACIFIC	50/50 = 100%	19/50 = 38%	2/50 = 4%	1/50 = 2%	18/50 = 36%
AUSTRALIAN	24/24 = 100%	2/24 = 8%	0/24 = 0%	0/24 = 0%	1/24 = 4%
AUSTRO-TAI	67/67 = 100%	43/67 = 64%	3/67 = 4%	0/67 = 0%	12/67 = 18%
ESKIMO-ALEUT	5/5 = 100%	0/5 = 0%	4/5 = 80%	0/5 = 0%	0/5 = 0%
NA-DENE	12/12 = 100%	12/12 = 100%	3/12 = 25%	0/12 = 0%	2/12 = 17%
MACRO-ALGONQUIAN	13/13 = 100%	8/13 = 62%	0/13 = 0%	0/13 = 0%	0/13 = 0%
SALISH	10/10 = 100%	10/10 = 100%	10/10 = 100%	0/10 = 0%	0/10 = 0%
WAKASHAN	2/2 = 100%	2/2 = 100%	2/2 = 100%	0/2 = 0%	0/2 = 0%
MACRO-SIOUAN	12/12 = 100%	7/12 = 58%	0/12 = 0%	0/12 = 0%	0/12 = 0%
PENUTIAN	43/43 = 100%	37/43 = 86%	20/43 = 47%	0/43 = 0%	1/43 = 2%
HOKAN	19/19 = 100%	18/19 = 95%	10/19 = 53%	0/19 = 0%	0/19 = 0%
AZTEC-TANOAN	15/15 = 100%	13/15 = 87%	3/15 = 20%	0/15 = 0%	0/15 = 0%
OTO-MANGUEAN	14/14 = 100%	13/14 = 93%	1/14 = 7%	0/14 = 0%	4/14 = 29%
MACRO-CHIBCHAN	10/10 = 100%	7/10 = 70%	0/10 = 0%	0/10 = 0%	0/10 = 0%
GE-PANO-CARIB	24/24 = 100%	15/24 = 62%	0/24 = 0%	0/24 = 0%	0/24 = 0%
ANDEAN-EQUATORIAL	39/39 = 100%	21/39 = 54%	2/39 = 5%	0/39 = 0%	1/39 = 3%
TOTAL	693/693 = 100%	337/693 = 49%	136/693 = 20%	42/693 = 6%	68/693 = 10%

	Voice Contrast In Stops	*Aspiration Contrast In Stops*	*Affricates*	*Fricatives*	*Sibilants*
AFRO-ASIATIC	29/29 = 100%	0/29 = 0%	22/29 = 76%	29/29 = 100%	29/29 = 100%
NIGER-KORDOFANIAN	50/51 = 98%	4/51 = 8%	24/51 = 47%	51/51 = 100%	50/51 = 98%
NILO-SAHARAN	24/25 = 96%	0/25 = 0%	16/25 = 64%	24/25 = 96%	22/25 = 88%
KHOISAN	3/4 = 75%	2/4 = 50%	3/4 = 75%	4/4 = 100%	4/4 = 100%
INDO-EUROPEAN	71/73 = 97%	13/73 = 18%	59/73 = 81%	73/73 = 100%	73/73 = 100%
CAUCASIAN	37/37 = 100%	3/37 8%	37/37 = 100%	37/37 = 100%	37/37 = 100%
URALIC	15/23 = 65%	0/23 = 0%	19/23 = 83%	23/23 = 100%	23/23 = 100%
ALTAIC	36/39 = 92%	3/39 = 8%	34/39 = 87%	39/39 = 100%	39/39 = 100%
PALEOSIBERIAN	3/8 = 37%	1/8 = 12%	6/8 = 75%	8/8 = 100%	5/8 = 62%
DRAVIDIAN	10/10 = 100%	1/10 = 10%	9/10 = 90%	10/10 = 100%	9/10 = 90%
SINO-TIBETAN	12/18 = 67%	15/18 = 83%	17/18 = 94%	18/18 = 100%	17/18 = 94%
AUSTRO-ASIATIC	16/17 = 94%	10/17 = 59%	9/17 = 53%	17/17 = 100%	17/17 = 100%
INDO-PACIFIC	37/50 = 74%	2/50 = 4%	14/50 = 28%	41/50 = 82%	37/50 = 74%
AUSTRALIAN	2/24 = 8%	1/24 = 4%	2/24 = 8%	2/24 = 8%	0/24 = 0%
AUSTRO-TAI	50/67 = 75%	8/67 = 12%	23/67 = 34%	66/67 = 99%	58/67 = 87%
ESKIMO-ALEUT	1/5 = 20%	0/5 = 0%	2/5 = 40%	5/5 = 100%	5/5 = 100%
NA-DENE	7/12 = 58%	7/12 = 58%	12/12 = 100%	12/12 = 100%	12/12 = 100%
MACRO-ALGONQUIAN	3/13 = 23%	1/13 = 8%	12/13 = 92%	13/13 = 100%	13/13 = 100%
SALISH	3/10 = 30%	0/10 = 0%	10/10 = 100%	10/10 = 100%	10/10 = 100%
WAKASHAN	0/2 = 0%	1/2 = 50%	2/2 = 100%	2/2 = 100%	2/2 = 100%
MACRO-SIOUAN	4/12 = 33%	1/12 = 8%	8/12 = 67%	12/12 = 100%	12/12 = 100%
PENUTIAN	26/43 = 60%	2/43 = 5%	41/43 = 95%	43/43 = 100%	42/43 = 98%
HOKAN	5/19 = 26%	3/19 = 16%	18/19 = 95%	19/19 = 100%	19/19 = 100%
AZTEC-TANOAN	7/15 = 47%	2/15 = 13%	15/15 = 100%	15/15 = 100%	15/15 = 100%
OTO-MANGUEAN	11/14 = 79%	1/14 = 7%	11/14 = 79%	14/14 = 100%	14/14 = 100%
MACRO-CHIBCHAN	7/10 = 70%	3/10 = 30%	6/10 = 60%	10/10 = 100%	10/10 = 100%
GE-PANO-CARIB	13/24 = 54%	1/24 = 4%	20/24 = 83%	22/24 = 92%	18/24 = 75%
ANDEAN-EQUATORIAL	19/39 = 49%	8/39 = 21%	31/39 = 79%	38/39 = 97%	34/39 = 87%
TOTAL	501/693 = 72%	93/693 = 13%	482/693 = 70%	657/693 = 95%	626/693 = 90%

	Glottal Fricatives	*Pharyngeal Fricatives*	*Nasals*	*Laterals*	*Vibrants*
AFRO-ASIATIC	20/29 = 69%	11/29 = 38%	29/29 = 100%	29/29 = 100%	29/29 = 100%
NIGER-KORDOFANIAN	26/51 = 51%	2/51 = 4%	51/51 = 100%	42/51 = 82%	39/51 = 76%
NILO-SAHARAN	16/25 = 64%	1/25 = 4%	25/25 = 100%	25/25 = 100%	25/25 = 100%
KHOISAN	4/4 = 100%	0/4 = 0%	4/4 = 100%	1/4 = 25%	4/4 = 100%
INDO-EUROPEAN	41/73 = 56%	2/73 = 3%	73/73 = 100%	73/73 = 100%	71/73 = 97%
CAUCASIAN	37/37 = 100%	23/37 = 62%	37/37 = 100%	37/37 = 100%	37/37 = 100%
URALIC	9/23 = 39%	0/23 = 0%	23/23 = 100%	23/23 = 100%	23/23 = 100%
ALTAIC	19/39 = 49%	2/39 = 5%	39/39 = 100%	37/39 = 95%	38/39 = 97%
PALEOSIBERIAN	2/8 = 25%	1/8 = 12%	8/8 = 100%	8/8 = 100%	6/8 = 75%
DRAVIDIAN	5/10 = 50%	0/10 = 0%	10/10 = 100%	10/10 = 100%	10/10 = 100%
SINO-TIBETAN	16/18 = 89%	0/18 = 0%	18/18 = 100%	16/18 = 89%	6/18 = 33%
AUSTRO-ASIATIC	15/17 = 88%	0/17 = 0%	17/17 = 100%	17/17 = 100%	16/17 = 94%
INDO-PACIFIC	17/50 = 34%	0/50 = 0%	50/50 = 100%	19/50 = 38%	34/50 = 68%
AUSTRALIAN	0/24 = 0%	0/24 = 0%	24/24 = 100%	24/24 = 100%	24/24 = 100%
AUSTRO-TAI	43/67 = 64%	1/67 = 1%	67/67 = 100%	60/67 = 90%	48/67 = 72%
ESKIMO-ALEUT	1/5 = 20%	0/5 = 0%	5/5 = 100%	5/5 = 100%	2/5 = 40%
NA-DENE	11/12 = 92%	0/12 = 0%	12/12 = 100%	12/12 = 100%	2/12 = 17%
MACRO-ALGONQUIAN	11/13 = 85%	0/13 = 0%	13/13 = 100%	6/13 = 46%	2/13 = 15%
SALISH	10/10 = 100%	2/10 = 20%	8/10 = 80%	10/10 = 100%	2/10 = 20%
WAKASHAN	2/2 = 100%	1/2 = 50%	2/2 = 100%	2/2 = 100%	0/2 = 0%
MACRO-SIOUAN	11/12 = 92%	0/12 = 0%	12/12 = 100%	4/12 = 33%	3/12 = 25%
PENUTIAN	32/43 = 74%	0/43 = 0%	43/43 = 100%	42/43 = 98%	24/43 = 56%
HOKAN	13/19 = 68%	1/19 = 5%	19/19 = 100%	18/19 = 95%	10/19 = 53%
AZTEC-TANOAN	14/15 = 93%	0/15 = 0%	15/15 = 100%	10/15 = 67%	8/15 = 53%
OTO-MANGUEAN	12/14 = 86%	0/14 = 0%	14/14 = 100%	14/14 = 100%	12/14 = 86%
MACRO-CHIBCHAN	9/10 = 90%	0/10 = 0%	9/10 = 90%	6/10 = 60%	8/10 = 80%
GE-PANO-CARIB	18/24 = 75%	1/24 = 4%	24/24 = 100%	2/24 = 8%	20/24 = 83%
ANDEAN-EQUATORIAL	31/39 = 79%	0/39 = 0%	39/39 = 100%	14/39 = 36%	33/39 = 85%
TOTAL	445/693 = 64%	48/693 = 7%	690/693 = 100%	566/693 = 82%	536/693 = 77%

	Liquids	*Both Laterals and Vibrants*	*Long Consonants*	*Retroflex Consonants*	*Clicks*
AFRO-ASIATIC	29/29 = 100%	29/29 = 100%	16/29 = 55%	3/29 = 10%	0/29 = 0%
NIGER-KORDOFANIAN	50/51 = 98%	31/51 = 61%	4/51 = 8%	4/51 = 8%	1/51 = 2%
NILO-SAHARAN	25/25 = 100%	25/25 = 100%	9/25 = 36%	8/25 = 32%	0/25 = 0%
KHOISAN	4/4 = 100%	1/4 = 25%	0/4 = 0%	1/4 = 25%	4/4 = 100%
INDO-EUROPEAN	73/73 = 100%	71/73 = 97%	8/73 = 11%	19/73 = 26%	0/73 = 0%
CAUCASIAN	37/37 = 100%	37/37 = 100%	17/37 = 46%	0/37 = 0%	0/37 = 0%
URALIC	23/23 = 100%	23/23 = 100%	12/23 = 52%	2/23 = 9%	0/23 = 0%
ALTAIC	39/39 = 100%	36/39 = 92%	5/39 = 13%	0/39 = 0%	0/39 = 0%
PALEOSIBERIAN	8/8 = 100%	6/8 = 75%	5/8 = 62%	0/8 = 0%	0/8 = 0%
DRAVIDIAN	10/10 = 100%	10/10 = 100%	3/10 = 30%	9/10 = 90%	0/10 = 0%
SINO-TIBETAN	18/18 = 100%	5/18 = 28%	0/18 = 0%	3/18 = 17%	0/18 = 0%
AUSTRO-ASIATIC	17/17 = 100%	16/17 = 94%	0/17 = 0%	8/17 = 47%	0/17 = 0%
INDO-PACIFIC	42/50 = 84%	11/50 = 22%	0/50 = 0%	3/50 = 6%	0/50 = 0%
AUSTRALIAN	24/24 = 100%	24/24 = 100%	1/24 = 4%	19/24 = 79%	0/24 = 0%
AUSTRO-TAI	67/67 = 100%	41/67 = 61%	6/67 = 9%	10/67 = 15%	0/67 = 0%
ESKIMO-ALEUT	5/5 = 100%	2/5 = 40%	2/5 = 40%	0/5 = 0%	0/5 = 0%
NA-DENE	12/12 = 100%	2/12 = 17%	0/12 = 0%	1/12 = 8%	0/12 = 0%
MACRO-ALGONQUIAN	6/13 = 46%	2/13 = 15%	3/13 = 23%	2/13 = 15%	0/13 = 0%
SALISH	10/10 = 100%	2/10 = 20%	0/10 = 0%	0/10 = 0%	0/10 = 0%
WAKASHAN	2/2 = 100%	0/2 = 0%	0/2 = 0%	0/2 = 0%	0/2 = 0%
MACRO-SIOUAN	7/12 = 58%	0/12 = 0%	0/12 = 0%	0/12 = 0%	0/12 = 0%
PENUTIAN	42/43 = 98%	24/43 = 56%	3/43 = 7%	9/43 = 21%	0/43 = 0%
HOKAN	19/19 = 100%	9/19 = 47%	0/19 = 0%	4/19 = 21%	0/19 = 0%
AZTEC-TANOAN	13/15 = 87%	5/15 = 33%	2/15 = 13%	4/15 = 27%	0/15 = 0%
OTO-MANGUEAN	14/14 = 100%	12/14 = 86%	0/14 = 0%	3/14 = 21%	0/14 = 0%
MACRO-CHIBCHAN	9/10 = 90%	5/10 = 50%	0/10 = 0%	2/10 = 20%	0/10 = 0%
GE-PANO-CARIB	22/24 = 92%	1/24 = 4%	0/24 = 0%	8/24 = 33%	0/24 = 0%
ANDEAN-EQUATORIAL	34/39 = 87%	13/39 = 33%	1/39 = 3%	9/39 = 23%	0/39 = 0%
TOTAL	661/693 = 95%	443/693 = 64%	97/693 = 14%	131/693 = 19%	5/693 = 1%

	Ejectives	*Implosives*	i u e o a	i u e ə o a	i u a
AFRO-ASIATIC	6/29 = 21%	12/29 = 41%	6/29 = 21%	7/29 = 24%	3/29 = 10%
NIGER-KORDOFANIAN	1/51 = 2%	15/51 = 29%	10/51 = 20%	2/51 = 4%	0/51 = 0%
NILO-SAHARAN	2/25 = 8%	11/25 = 44%	4/25 = 16%	2/25 = 8%	0/25 = 0%
KHOISAN	2/4 = 50%	0/4 = 0%	1/4 = 25%	1/4 = 25%	0/4 = 0%
INDO-EUROPEAN	1/73 = 1%	1/73 = 1%	18/73 = 25%	5/73 = 7%	3/73 = 4%
CAUCASIAN	37/37 = 100%	1/37 = 3%	11/37 = 30%	0/37 = 0%	0/37 = 0%
URALIC	0/23 = 0%	0/23 = 0%	1/23 = 4%	1/23 = 4%	0/23 = 0%
ALTAIC	1/39 = 3%	0/39 = 0%	2/39 = 5%	2/39 = 5%	0/39 = 0%
PALEOSIBERIAN	1/8 = 12%	0/8 0%	0/8 = 0%	2/8 = 25%	0/8 = 0%
DRAVIDIAN	0/10 = 0%	0/10 = 0%	9/10 = 90%	1/10 = 10%	0/10 = 0%
SINO-TIBETAN	0/18 = 0%	0/18 = 0%	3/18 = 17%	1/18 = 6%	0/18 = 0%
AUSTRO-ASIATIC	0/17 = 0%	4/17 = 24%	6/17 = 35%	2/17 = 12%	0/17 = 0%
INDO-PACIFIC	2/50 = 4%	1/50 = 2%	23/50 = 46%	8/50 = 16%	3/50 = 6%
AUSTRALIAN	0/24 = 0%	0/24 = 0%	5/24 = 21%	0/24 = 0%	13/24 = 54%
AUSTRO-TAI	1/67 = 1%	4/67 = 6%	29/67 = 43%	3/67 = 4%	1/67 = 1%
ESKIMO-ALEUT	1/5 = 20%	0/5 = 0%	0/5 = 0%	0/5 = 0%	4/5 = 80%
NA-DENE	12/12 = 100%	0/12 = 0%	2/12 = 17%	0/12 = 0%	2/12 = 17%
MACRO-ALGONQUIAN	0/13 = 0%	0/13 = 0%	2/13 = 15%	1/13 = 8%	1/13 = 8%
SALISH	10/10 = 100%	0/10 = 0%	0/10 = 0%	0/10 = 0%	2/10 = 20%
WAKASHAN	2/2 = 100%	0/2 = 0%	0/2 = 0%	1/2 = 50%	0/2 = 0%
MACRO-SIOUAN	3/12 = 25%	0/12 = 0%	4/12 = 33%	1/12 = 8%	0/12 = 0%
PENUTIAN	31/43 = 72%	14/43 = 33%	22/43 = 51%	4/43 = 9%	3/43 = 7%
HOKAN	7/19 = 37%	0/19 = 0%	11/19 = 58%	2/19 = 11%	1/19 = 5%
AZTEC-TANOAN	2/15 = 13%	0/15 = 0%	3/15 = 20%	1/15 = 7%	0/15 = 0%
OTO-MANGUEAN	1/14 = 7%	1/14 = 7%	4/14 = 29%	0/14 = 0%	0/14 = 0%
MACRO-CHIBCHAN	2/10 = 20%	1/10 = 10%	2/10 = 20%	0/10 = 0%	0/10 = 0%
GE-PANO-CARIB	1/24 = 4%	1/24 = 4%	1/24 = 4%	0/24 = 0%	0/24 = 0%
ANDEAN-EQUATORIAL	3/39 = 8%	2/39 = 5%	8/39 = 21%	0/39 = 0%	4/39 = 10%
TOTAL	129/693 = 19%	68/693 = 10%	187/693 = 27%	47/693 = 7%	40/693 = 6%

	i u e o ɛ ɔ a	*Front Rounded Vowels*	*Back Unrounded Vowels*	*Nasal Vowels*	*Long Vowels*
AFRO-ASIATIC	1/29 = 3%	0/29 = 0%	0/29 = 0%	0/29 = 0%	17/29 = 59%
NIGER-KORDOFANIAN	21/51 = 41%	3/51 = 6%	1/51 = 2%	27/51 = 53%	24/51 = 47%
NILO-SAHARAN	5/25 = 20%	0/25 = 0%	1/25 = 4%	1/25 = 4%	12/25 = 48%
KHOISAN	1/4 = 25%	0/4 = 0%	0/4 = 0%	4/4 = 100%	2/4 = 50%
INDO-EUROPEAN	7/73 = 10%	15/73 = 21%	0/73 = 0%	19/73 = 26%	33/73 = 45%
CAUCASIAN	0/37 = 0%	12/37 = 32%	1/37 = 3%	14/37 = 38%	15/37 = 41%
URALIC	0/23 = 0%	13/23 = 57%	5/23 = 22%	0/23 = 0%	13/23 = 57%
ALTAIC	0/39 = 0%	25/39 = 64%	21/39 = 54%	1/39 = 3%	23/39 = 59%
PALEOSIBERIAN	0/8 = 0%	0/8 = 0%	0/8 = 0%	0/8 = 0%	4/8 = 50%
DRAVIDIAN	0/10 = 0%	0/10 = 0%	0/10 = 0%	1/10 = 20%	10/10 = 100%
SINO-TIBETAN	1/18 = 6%	7/18 = 39%	5/18 = 28%	3/18 = 17%	5/18 = 28%
AUSTRO-ASIATIC	1/17 = 6%	0/17 = 0%	2/17 = 12%	6/17 = 35%	7/17 = 41%
INDO-PACIFIC	0/50 = 0%	1/50 = 2%	0/50 = 0%	2/50 = 4%	14/50 = 28%
AUSTRALIAN	0/24 = 0%	0/24 = 0%	0/24 = 0%	0/24 = 0%	9/24 = 37%
AUSTRO-TAI	2/67 = 3%	3/67 = 4%	5/67 = 7%	2/67 = 3%	38/67 = 57%
ESKIMO-ALEUT	0/5 = 0%	0/5 = 0%	0/5 = 0%	0/5 = 0%	3/5 = 60%
NA-DENE	0/12 = 0%	0/12 = 0%	0/12 = 0%	8/12 = 67%	9/12 = 75%
MACRO-ALGONQUIAN	1/13 = 8%	0/13 = 0%	1/13 = 8%	2/13 = 15%	11/13 = 85%
SALISH	0/10 = 0%	0/10 = 0%	0/10 = 0%	0/10 = 0%	3/10 = 30%
WAKASHAN	0/2 = 0%	0/2 = 0%	0/2 = 0%	0/2 = 0%	1/2 = 50%
MACRO-SIOUAN	0/12 = 0%	0/12 = 0%	0/12 = 0%	8/12 = 67%	8/12 = 67%
PENUTIAN	0/43 = 0%	0/43 = 0%	3/43 = 7%	0/43 = 0%	26/43 = 60%
HOKAN	0/19 = 0%	0/19 = 0%	0/19 = 0%	1/19 = 5%	15/19 = 79%
AZTEC-TANOAN	0/15 = 0%	1/15 = 7%	3/15 = 20%	3/15 = 20%	11/15 = 73%
OTO-MANGUEAN	1/14 = 7%	0/14 = 0%	3/14 = 21%	13/14 = 93%	3/14 = 21%
MACRO-CHIBCHAN	0/10 = 0%	0/10 = 0%	0/10 = 0%	6/10 = 60%	0/10 = 0%
GE-PANO-CARIB	0/24 = 0%	0/24 = 0%	10/24 = 42%	9/24 = 37%	6/24 = 25%
ANDEAN-EQUATORIAL	0/39 = 0%	0/39 = 0%	5/39 = 13%	23/39 = 59%	13/39 = 33%
TOTAL	41/693 = 6%	80/693 = 12%	66/693 = 10%	154/693 = 22%	335/693 = 48%

	Tone	Vowel Harmony	SOV	SVO	VSO	NA	AN
AFRO-ASIATIC	11/29 = 38%	3/29 = 10%	10	10	5	18	6
NIGER-KORDOFANIAN	41/51 = 80%	12/51 = 24%	2	29	0	23	5
NILO-SAHARAN	20/25 = 80%	9/25 = 36%	9	9	5	24	0
KHOISAN	4/4 = 100%	0/4 = 0%	1	2	0	1	1
INDO-EUROPEAN	7/73 = 10%	1/73 = 1%	24	34	3	22	37
CAUCASIAN	0/37 = 0%	3/37 = 8%	16	11	0	1	25
URALIC	0/23 = 0%	15/23 65%	14	6	0	0	21
ALTAIC	2/39 = 5%	31/39 = 79%	38	1	0	0	39
PALEOSIBERIAN	0/8 = 0%	1/8 = 12%	8	0	0	0	8
DRAVIDIAN	0/10 = 0%	0/10 = 0%	10	0	0	0	10
SINO-TIBETAN	17/18 = 94%	0/18 = 0%	6	8	0	5	7
AUSTRO-ASIATIC	3/17 = 18%	1/17 = 6%	1	5	0	5	1
INDO-PACIFIC	14/50 = 28%	1/50 = 2%	26	1	0	14	3
AUSTRALIAN	0/24 = 0%	0/24 = 0%	24	0	0	23	0
AUSTRO-TAI	7/67 = 10%	1/67 = 1%	0	16	16	27	4
ESKIMO-ALEUT	0/5 = 0%	0/5 = 0%	0	4	0	3	0
NA-DENE	7/12 = 58%	0/12 = 0%	2	0	0	1	1
MACRO-ALGONQUIAN	1/13 = 8%	0/13 = 0%	1	3	0	2	1
SALISH	0/10 = 0%	0/10 = 0%	0	0	2	0	0
WAKASHAN	0/2 = 0%	0/2 = 0%	0	0	0	0	0
MACRO-SIOUAN	1/12 = 8%	0/12 = 0%	2	0	0	2	0
PENUTIAN	1/43 = 2%	2/43 = 5%	3	5	3	3	14
HOKAN	2/19 = 11%	0/19 = 0%	0	0	0	0	0
AZTEC-TANOAN	4/15 = 27%	0/15 = 0%	2	2	0	1	2
OTO-MANGUEAN	12/14 = 86%	1/14 = 7%	0	1	6	7	1
MACRO-CHIBCHAN	1/10 = 10%	1/10 = 10%	4	1	1	4	1
GE-PANO-CARIB	4/24 = 17%	1/24 = 4%	4	0	0	4	1
ANDEAN-EQUATORIAL	5/39 = 13%	1/39 = 3%	3	4	3	4	5
TOTAL	164/693 = 24%	84/693 = 12%	210/406 = 52%	152/406 = 37%	44/406 = 11%	194/387 = 50%	193/387 = 50%

Functional Constraints on Grammars*

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1. The grammars of natural languages are cultural instruments for the effective association of sounds and meanings in human societies. Like all other instrumental objects, therefore, it is the function of grammars that determines both their essential characteristics and their range of possible variation and change. The formal properties and uses of particular grammars and grammatical principles can thus be appropriately accounted for only by theories that provide a basis for the derivation of these attributes as consequences of the common instrumental function of all grammars as cultural devices for the symbolic association of sounds and meanings.[1]

Any theory that fails to generate such functionally-based explanations will simply fail to be a real theory about grammars, in precisely the same sense that a theory referring only to the physical properties of hammers, or the psychology of hammer-users, would fail to be a real theory about hammers. An instrumental object, in other words, *exists* in a very real sense only *because* of its function, and can be significantly investigated and understood, therefore, only in terms of that function.

This is particularly true for the parts, or components, of instrumental objects, which frequently have instrumental functions of their own that contribute crucially to the functions of the whole instruments that include them. The fact that hammers have handles, for example, can be satisfactorily understood and explained only in terms of the particular function of a hammer-handle relative to the general function of the hammer of which it is a part. Similarly, the existence and structure of a particular component or constituent principle of grammars — like lexical rules, ellipsis constraints, principles of epenthesis or question-formation — can be adequately accounted for only in terms of its particular grammatical function, the particular contribution that it makes towards achievement of the functional goals of grammars as wholes.

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[1] Sounds are of course not the only possible kind of publicly-perceptible alterations of the environment that can be symbolically associated with the privately-perceptible things we call meanings. Theories of natural language must therefore be general enough to accommodate gestural languages as well as spoken ones. In the present universe, nevertheless, the preponderance of spoken languages over all others is a consequence of natural selection rather than mere accident, and is thus a functionally explainable characteristic of actual languages.

Functional analysis and explanation is equally necessary, of course, for all facts concerning the normal use or behavior of instrumental objects. To understand why hammers are standardly gripped by their handles rather than by their heads, it is obviously necessary to appeal to facts about the function of hammers and the contributory functions of their parts. And to understand why the lexical rules of grammars are appropriately used only to effect additions of phonological elements in phonetically-directed derivations and deletions of such elements in semantically-directed derivations, it is clearly necessary to recognize that it is precisely this manner of application, and no other, that is compatible with the universal grammatical function of sound-meaning association.[2]

With respect to both structure and use, therefore, the scientific study of instrumental objects like grammars must be based crucially on the functions of these objects, and must seek to determine the natural relations that hold between these functions and the specific formal or behavioral characteristics of the instruments that might serve them.

To say that an object is an instrument, however, or that it has an instrumental function, is *not* to say that *every* fact about its structure and use can be derived as a necessary consequence of that function. It appears to be the case, in fact, that form and use are invariably *underdetermined* by function. Thus from the function of knives, for example, as instruments for cutting, one cannot predict or explain the fact that this particular knife has this particular carved geometric pattern on its handle. Or that this other knife has a representation of a deer on its handle. Or that this one has a handle that is completely plain. What *can* be functionally explained here is the fact that *every* particular knife *has* a handle, and that *no* knife has a handle made of cotton candy, for example, or a single strand of lamb's wool. A functionally based theory of knives would in fact predict that knife-handles *must* vary — within certain limits — in their decoration or lack of decoration, since there is no functional reason for them *not* to vary in this way — carved and plain handles, for example, being equally compatible with the instrumental cutting function of knives.

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[2] A *phonetically-directed derivation* is an ordered sequence of equivalent representations of a linguistic object such that the first representation is a *semantic representation* (a string of property and relational elements that are each interpretable into non-null observation statements about meanings) and the last is a *phonetic representation* (a string of elements that are each interpretable into non-null observation statements about articulatory gestures). A

The function of instruments thus determine their forms and uses only by *delimitation* — that is, by imposing natural boundaries, or *constraints*, on their range of possible variation. This means that the basic strategy of functional analysis and explanation must be a strategy of progressive narrowing, of continued search for functionally-determined constraints on the possible forms and uses of all instruments of the type under investigation. The results of such analysis will always reveal that there are some characteristics of any particular instrument that are partly or wholly undetermined by its function — except in the sense that they are consistent with that function and hence within the predicted range of variation for instruments which serve that function.

The characteristics of a given instrument will actually be partitioned always into a set of three significantly distinct classes:

(1) the class of characteristics that are *determined* by the instrument's function — in the sense that any object lacking these characteristics would be *incapable* of serving the function that defines instruments of the given type, and thus would not qualify as an instance of that type;

(2) the class of characteristics that are *justified* but not determined by the instrument's function — in the sense that any instrument having these characteristics would serve the defining function of that type of instrument in a *better* way — e.g. in a simpler, faster, less error-prone or energy-consuming way — than any otherwise identical instrument that lacks these characteristics;

(3) the class of characteristics that are simply *compatible* with the instrument's function, but neither determined nor justified by it.

The functionally determined characteristics of an instrument are its essential properties, the natural and non-arbitrary attributes that are universal in the set of all instruments of its type. The functionally justified characteristics of an instrument are neither essential nor wholly arbitrary, and can be adequately accounted for only as the products of selective adaptation during the course of historical evolution of the instrument.

semantically-directed derivation is a sequence of equivalent representations that is initiated by a phonetic representation and terminated by a semantic representation. See Sanders (1972) for further discussion.

The functionally compatible, or merely permissible, characteristics of an instrument, finally, which are all those that are neither necessary nor particularly useful for the achievement of its function, are among the random, or arbitrarily variable, properties of instruments of the given type, and can be accounted for, therefore, only in terms of the particular non-evolutionary history of particular instruments.

Recognition of these distinctions between the functional determination, justification, and permissibility of characteristics is obviously one of the essential prerequisites to the productive investigation and scientific analysis of instrumental objects of any type. These distinctions in fact determine the natural divisions of scientific labor and methodology that are appropriate to such investigation.

The study of linguistic universals, or universal grammar, for example, will thus be properly concerned with the discovery and functional explanation of those characteristics of natural language grammars that are determined by their function. The study of language change, in all of its systematic or evolutionary aspects, will be concerned almost exclusively with those characteristics of grammars that are justified but not fully determined by their function. All other types of linguistic research, including the study of individual variation, non-evolutionary language changes, and certain aspects of the phonology, syntax, and lexicology of individual languages, will be concerned, finally, with those characteristics of grammars that are functionally permissible, that is, neither determined nor justified in terms of the instrumental grammatical goal of sound-meaning association.

The natural partition of characteristics imposed on any instrument by virtue of its instrumentality can thus be seen to determine three distinct classes of linguistic facts, each with its own distinctive basis and system of appropriate inquiry and explanation. Failure to observe this crucial distinction is one of the major reasons, I believe, for the general failure of the attempts at functional explanation that have been made thus far in linguistics.[3]

The general logic and methodology of functional analysis requires the recognition of certain other crucial empirical distinctions as well, and their strict observance in all empirically-significant analyses of instrumental objects. One of these is the distinction between the functions of whole instruments and the functions of their parts.

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[3] Although I will have nothing to say here about these particular attempts, it should hopefully be evident from my present remarks that none of their inadequacies are due to any inherent peculiarity or intractability of linguistic data, but, rather, simply to a general failure to make such crucial distinctions as are discussed here, or to fully satisfy the logical and methodological prerequisites for the successful investigation of *any* type of instrumental object. Parallel failures, for precisely parallel reasons, can in fact be found also in such fields as biology, anthropology, economics, and literary analysis.

In general, though not always, a part of an instrument will have a function if and only if that function makes an essential contribution to the function of the whole instrument that includes it. The handle of a knife, for example, has the function of making the knife firmly grippable, which contributes directly to the function of the whole knife as a humanly-usable instrument for cutting. The carving on the knife's handle, on the other hand, or the loop of leather attached to it, make no contribution to the function of the whole instrument — though they might, of course, have functions of their own, independent of that of their including instrument.

A good example of contributory function in grammars is provided by the principle of passive sentence formation in the grammar of Chippewa, or Ojibwe. In this language transitive verbs include a clitic pronominal form referring to the subject argument of the verb, usually prefixed to the verb stem, and another clitic pronominal, usually suffixed to the stem, that refers to the most precedent of its non-subject arguments. Moreover, like Spanish and many other languages, Chippewa observes a strict 2-1-3 person-order constraint on the relative ordering of clitic pronouns in verbs.[4] Words with the structures represented in (1a) are thus well-formed in this language, while those with structures represented in (1b) are not.

(1)(a) [[2nd-person, subject][verb-stem][1st-person, non-subject]]
[[2nd-person, subject][verb-stem][3rd-person, non-subject]]
[[1st-person, subject][verb-stem][3rd-person, non-subject]]

(b) *[[1st-person, subject][verb-stem][2nd-person, non-subject]]
*[[3rd-person, subject][verb-stem][2nd-person, non-subject]]
*[[3rd-person, subject][verb-stem][1st-person, non-subject]]

In the grammar of Chippewa, therefore, the constituent principle of passive formation has the function of generating lexically permissible expressions for predications with first-person agents and second-person patients and for those with 3rd-person agents and non-3rd-person patients. This is a function, moreover, which clearly makes an essential contribution to the function of the including grammar as a whole — the universal grammatical function of associating *every* meaning with *some* permissible expression.

In the grammar of English, on the other hand, this same, or essentially same, principle of passive formation does not have this function. Nor, on the basis of present knowledge, does it have any other contributory function with respect to the symbolic association function of the whole grammar of English that includes it. Thus, while the principle of passive formation is a functionally determined constituent of the grammar of Chippewa, with a well-defined contributory function of its own, this principle appears to be only a functionally permissible — or, possibly, functionally justified — constituent of the grammar of English, whose inclusion or non-inclusion in this grammar has no effect on its capacity to achieve its essential function of sound-meaning association.

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[4] For discussion of clitic pronoun ordering constraints, see Delisle (1972) for Chippewa, and Perlmutter (1970) for French and Spanish. See also Sanders (1974a).

It is the study of contributory functions, of course, that is of primary concern in all sciences that deal with instrumental objects. Thus we ordinarily know, *prior* to any real scientific investigation or theory-construction, what the functions of whole instruments are, and many universal constraints on form and use that are determined by those functions. What we don't know, and what can only be discovered through painstaking investigation and rigorous testing, is the functional status (or non-status) of the individual parts and properties of whole instruments. Functional analysis is thus primarily the attempt to determine which parts of a given instrument are functionally determined and which are not, which parts have individual functions that contribute to the function of the whole instrument that includes them, and which have no essential contributory functions at all. Such analysis presupposes both of the distinctions mentioned thus far, as well as an explicit system, or metalanguage, for the expression of functional laws — empirically testable generalizations about the constraints on form and use that are imposed by the functions of instruments, and about the relations that hold between the superordinate functions of whole instruments and the subordinate or contributory functions of their constituent parts or properties.

The cited contrast between the grammatical roles of passive formation in English and Chippewa serves also to exemplify still another crucial distinction that must be recognized and strictly observed in all serious investigations of instrumental objects. This is the distinction between instrumental types and sub-types — or, more specifically, between those characteristics of an instrument that are functionally determined for all instruments of its most generic type — for example, all cutting instruments, or all grammars — and those characteristics that are functionally determined only for a given subtype, or species, of that instrumental type — for example, the species of cutting instruments that are knives, or knives with copper blades and wooden handles, or the species of grammars that include clause-final ordering principles for verbs, or those with constraints against tautosyllabic consonant clusters.

The principle of passive formation is clearly not determined by the common symbolic association function of all grammars. The most obvious evidence of this is the fact that there are systems that serve this universal function but include no principle of passive formation of any sort — for example, the grammar of Basque, and the grammar of Dakota. But there is at least one *subtype* of grammar, nevertheless, for which a constituent principle of passive formation *is* functionally determined — in which the specific function of this principle makes an essential contribution to the generic association function of the whole grammar that includes it. This subtype, which includes the grammar of Chippewa but not the grammars of English or Spanish, for example, consists of the set of all grammars which include both a person-order constraint on the enclitic pronominal constituents of verbs and a principle of obligatory encliticization (or agreement) for both subjects and non-subjects of transitive verbs. It is evident that for any grammar of this type the existence of passive formation would make an essential contribution to the association function of the whole grammar — by permitting both members of a pair of meanings like 'I saw you' and 'You saw me' to be associated with expressions that are consistent with the grammar's person-order constraint. Passive formation is thus a functionally determined characteristic of all grammars of the Chippewa-type, but not of all grammars in general.

2. What I have attempted to do thus far is to outline some of the concepts and conceptual distinctions that I feel are most fundamental to the systematic study of instrumental objects like grammars, and some of the basic logical and methodological prerequisites to the functional analysis and explanation of their characteristics. The major points that have been suggested are:

(1) that the function of an instrument effects or determines its form and use by imposing *constraints*, or delimitations, on the range of possible variation of all instruments of that type;

(2) that for any particular instrument, some of its characteristics will be functionally *determined*, others will be functionally *justified*, and still other will be only functionally *permissible*;

(3) that some but not all of the *parts* of any instrument will have instrumental functions of their own which contribute essentially to the function of the whole instrument that includes them;

(4) that certain instrumental parts or properties will be functionally determined (or functionally justified) only for certain particular *subtypes*, or species, of a general instrument-type.

These points, however, and the general metatheory for functional analysis that they suggest, have been dealt with so far only in a very general and informal way. I would thus like to look a little more closely now at the crucial notions of 'instrument' and 'function' themselves and some of the basic principles of scientific methodology and explanation associated with them. Finally, then, I would like to take one actual subpart of a particular grammar, and attempt to show how it serves to exemplify the various general points about functional analysis that have been discussed, and how its particular characteristics can be accounted for in terms of the general metatheory for functional explanation that is being suggested here.

The notions of 'instrument' and 'function' are fundamental concepts in the system of natural analysis and inference that constitutes the basis for everyday human thought and reasoning. Like all other such very basic notions, they are easy to think *with*, but quite difficult to think *about*. Satisfactory working definitions of them can nevertheless be provided, which will be adequate, I believe, for all purposes of empirical science.

'Instrument' is a less primitive notion than 'function', and can be satisfactorily defined in terms of the latter notion. Thus an instrument would seem to be simply an object that has a function (or set of functions), and that exists, or continues to exist, *because* of that function. A clock, for example, has the function of recording or revealing the passage of time; and clocks exist, and continue to exist, because they have this function. Clocks are thus instruments for telling time. Similarly, chairs are instruments for sitting, wings are instruments for flying, governments are instruments for the insurance of life, liberty, and the pursuit of happiness. And grammars are instruments for the symbolic association of articulated sounds and meanings.

Rocks, stars, and clouds, on the other hand, are not instruments. Although they can often have beneficial effects, of course, and can be used as effective tools or means to some end — like a star that is used for navigation, or a rock used for cutting things — this shows only that non-animate and non-cultural objects can sometimes serve, or be used, *as* instruments, not that they *are* instruments. They would be such, in fact, only if one were to believe that stars were made to be navigated by, that rocks came into existence, and continue to exist, *because* of their capacity to cut things.

The class of instruments would appear to be identical, in fact, to the class of all living things and their parts, properties, and cultural extensions. The most superordinate of all instrumental functions, therefore, which is the common function of all plants, animals, and cultures, would appear to be simply the perpetuation of the individual and its species. From this point of view, then, grammars would be functionally justified (if not functionally determined) constituents of human cultures, whose perpetuation function is at least strongly facilitated by the symbolic association function of their constituent grammars. Linguistics, however, as the science of language, is concerned only with the function of grammars and those functions that are subordinate to it. The study of higher functions, and the contribution of grammatical function to them, falls in the more general domain of the science of culture, anthropology, and the science of life, biology.

Since instruments can be adequately defined as things with functions that exist and persist because of their functions, it is only the more primitive notion of function itself that requires explication here. Because of its very primitiveness, however, this notion remains highly resistant to complete analysis, in spite of the many attempts at explication that have been made by philosophers of science and others. Of the proposed accounts that I know of, the simplest and conceptually most adequate is that presented by Larry Wright in his paper "Functions" (1973). Wright, before giving his own account, describes and evaluates a number of previous characterizations and shows that each is inadequate in one or both of the following crucial respects: (1) through failure to accommodate the functions of both *natural* instruments (like the epiglottis in man, or chlorophyl in plants) and *consciously designed*, or *artificial*, instruments (like a chair, or the sweep second hand of a watch); or (2) through failure to distinguish the *function(s)* of an instrument from the (possibly quite beneficial) things that it does by *accident* (like the deflection of bullets by belt buckles, or the audible beating of hearts). I think that Wright is entirely correct, moreover, in considering the function-accident distinction to be of the utmost significance here, and the artificial-natural distinction to be of no real significance at all. Thus when we ask if X has function F in system S, we are asking if the attainability of F in S is a non-accidental consequence of the presence of X in S. We are *not* asking *how* X *came* to be present in S, whether by human or divine intention, by processes of selective adaptation, by sheer chance, or whatever.[5]

Wright's own explication of the notion 'function' is based crucially on the idea that all functional ascriptions have the essential force of explanations. He notes, for example, the essential synonymy between expressions of the forms "What is the function of X in S?" and "Why do S's have X's?". The questions "What is the function of the human heart?" and "Why do humans have hearts?" both request an explanation for the existence (and persistence) of the heart as a component of the human organism. It is important to note, however, that the *kind* of existence explanation that is sought in cases like this is not an historical one — it would not do to answer

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[5] See Simon (1969) and Rudner (1966) for additional evidence of the non-significance of the distinction between artificial and natural functional systems. Simon's book contains provocative insights on many aspects of functional analysis, as well as specific proposals for a general theory of instrumental function and design.

"Humans have hearts because someone or something *made* them that way". What is sought, rather, is a *teleological* kind of explanation — "Humans have hearts because they cause blood to circulate", "Porcupines have quills hecause they serve to repel predators", "Watches have sweep second hands because they facilitate precise time determinations", "Languages have elliptical coordinations because they permit whole assertions, questions, etc., to be expressed by single words or phrases". What is being offered in such instances is an existence explanation for a part or property of an instrument by means of a functional ascription of that part or property — a statement of what it *does for* the whole instrument that includes it.

Existence questions can always be answered with purely historical accounts too, of course, by reference to particular sequences of actual law-governed genetic events, natural or artificial selections, etc. But an historical explanation of something will be acceptable only as a last resort, only if no *other kind* of explanation is possible. This is the case for non-instrumental objects, like rocks and stars and fields of gravity, which exist and persist, not because of any of their consequences or effects, but only because they have simply been *made* to exist and persist by the nature of the universe that includes them. For instrumental objects, on the other hand, and their properties and parts, another kind of explanation will always be possible in principle — explanation by function — and it is this rather than historical explanation that will naturally be sought.

To capture the explanatory force of all real functional ascriptions, as well as the crucial distinction between the function of an object and its merely accidental effects, Wright offers the analysis in (2) (Wright 1973:161) as his general explication of the notion 'function'.

(2) The function of *X* [in system *S*] is *Z* *means*
  (a) *X* is there [in *S*] because it does *Z*,
  (b) *Z* is a consequence (or result) of *X*'s being there.

It is clause (a) of the analysis, of course, that most directly expresses the essential connection between functional ascription and explanation. The role of clause (b), however, which Wright deals with only briefly and rather unclearly, is also of crucial importance here. The primary effect of clause (b) is to exclude from the class of things with functions all things whose effects are *completely redundant*. In other words, *Z* cannot be a function of *X* in system *S* unless there is at least *some* context or set of circumstances in which *Z* obtains in *S* and *Z* does not obtain in system *S'*, which is identical to *S* except for the absence of *X*. It is important to note, however, that this does *not* mean that things with functions must be *logically* necessary (or sufficient) for the achievement of those functions, or that they must be *actually* necessary in their systems under *all* circumstances and in *all* contexts. The hand-brake and the foot-brake of a car thus both have the function of stopping the car, in spite of the fact that each is redundant to the other in a large number of circumstances. What is crucial is just that there are *some* situations (when the driver has both hands on the wheel, when the foot-brake can't be depressed) in which each is a *non*-redundant systematically necessary condition for car stopping.

Clause (b) of (2) thus characterizes functional objects as things that are not wholly redundant for the achievement of their functions in the systems that include them. This suggests what must certainly be the standard and most fundamental type of empirical test for functionhood – the test by subtraction of parts. Thus the simplest and most definitive proof that circulation of the blood is the function of the heart would be by showing that in a human being with a heart the blood circulates, while in an otherwise identical human without a heart the blood does not circulate. Similarly, if one were to claim that the function of passive formation in English is the achievement of clause-initial positioning for non-agentive arguments, this claim could be most simply and most definitively refuted by showing that any argument that can be preposed by passive formation can also be preposed by topicalization, and hence that the principle of passive formation is wholly redundant for the achievement of clause-initial positionings, and could be subtracted from the grammar of English without any effect whatever on its capacity to achieve such positionings.

Turning now to clause (a) of the explication in (2), it should be noted first, as Wright himself does, that the predicate "does" appears to be insufficiently general here, and should perhaps really be understood to also include the meanings of "did", "can/could do", and perhaps even "will/would do". Thus, for example, it is appropriate to say that the windshield wiper of a car has the function of cleaning the car's windshield even if it is never turned on, and even if, due to faulty assembly work on a particular car, it *couldn't* be turned on. All that is required is that it *would* clean the windshield if it *had* been properly installed and *was* turned on. These are non-standard, or defective, cases, of course, but they can be quite naturally understood and explicated as modal inflections from the standard case of simply doing *Z*.

The situation is similar for instruments or instrument parts that did something functional *once*, but no longer do so — like the vermiform appendix in man, or the case inflection of English pronouns. In practice, of course, the study of functions is often very largely concerned with the determination of past rather than present functions. The task of the linguist, in particular, is thus frequently just like that of the archaeologist faced with an anciently produced artifact, possibly quite damaged or degraded by time, trying to determine what the artifact *was* used for. But there are no real conceptual difficulties associated with the idea of there being a presently functionless part of a system which had a function in the ancestor of that system. All such cases of past function can also be simply understood as well-defined (temporal) inflections from the standard case of doing *Z*.

Clause (a) explicitly limits the possible functions of *X* to those things that can serve as *reasons* for the existence of *X* in the system to which it belongs. This limitation effectively distinguishes between the functions of instrumental objects and their various accidental effects or consequences. For example, though belt buckles do serve to deflect bullets, this is not the reason why belts have buckles. So, while a buckle may be said to sometimes *function as* a bullet deflector, bullet deflection is *not* its *function*. Similarly, though recursive modification of nominals permits ideas to be expressed by sentences that are ten thousand words long, the generation of ten-thousand-word sentences is obviously not the reason why languages have recursive modification devices. Such devices may by accident function as sources of long sentences, but this is not their function, or even one of their functions. It is just something that they do by accident, something that plays no role in explaining the existence and persistence of these devices in the grammars of human languages.

Though conceptually quite straightforward, clause (a) embodies all of the real complexities involved in the actual scientific practice of functional analysis. Thus while it is always relatively easy to determine whether *X* does or does not have *Z* as one of its consequences, it is generally extremely difficult to determine whether having *Z* as a consequence is really the reason for *X*'s existence. But, of course, this is not a problem that is unique to *functional* analysis. It is always difficult to determine whether *anything* is the real reason for anything, in physics no less than in linguistics, for explanations by natural laws no less than for those by functional ascriptions. No scientific explanation, in fact, can ever be *known* to be true, regardless of what kind of explanation it is, or what kinds of things it purports to explain. For functional explanations, then, like all others, a given explanation can never be more than provisionally acceptable, and will be accepted at a given time only to the extent that it provides a satisfying answer to some of our why-questions and is consistent with the best present answers to all of our other why-questions. The strength of our belief that *X* exists in *S* because it has *Z* as a consequence will thus depend crucially on the global conceptual values of this explanation and its consistency with the best available explanations for all other parts and properties of *S* and of all other systems that are comparable to it. These same criteria for confidence apply to all types of explanation in all branches of empirical science.

There are certain real differences, nevertheless, between explanation by genetic law and explanation by function. First, while *everything* has a genetic explanation, only *certain* things have functional explanations. This means that whereas the physical scientist can know *a priori* that everything in his domain *has* a physical explanation, the social or biological scientist can never know, in advance of investigation and theory-construction, which things in his domain have social or biological explanations and which things don't. In fact, the only possible way of knowing that something is functionally explainable is by knowing an adequate functional explanation of that thing.

There are also significant differences between genetic and functional explanations in the heuristic and methodological procedures that are appropriately associated with them. In the physical and historical sciences, it is often highly desirable to isolate certain parts or properties of things for analysis and explanation independently of the various superordinate systems that include them. In all sciences that deal with instrumental objects, though, this strategy would be invariably counterproductive. Instead, when we do functional analysis, we always start with some relatively global instrument that has a clearly known function, and proceed then to examine its parts and properties to determine by something like the subtraction test, whether these have any non-redundant consequences that are essential consequences of the superordinate instrument that includes them. The functions of things, in other words, can be neither discovered, described, nor explained except in reference to the functions of the whole instruments or instrumental systems to which they belong. This is the essence of functional analysis, and the foundation principle for all productive investigations of instrumental objects.

3. To illustrate the linguistic applicability of the general metatheory for functional analysis that has been suggested here, I would like to turn now to a particular set of facts about the grammar of Dakota, a Siouan language spoken in parts of Minnesota and the states of North and South Dakota.

Let us consider, then, the constituent principles of Dakota grammar that are represented in (3), which constitute a subset of the lexical equivalence rules for the bound pronominal constituents of verbs and other predicates in this language.

(3) (a) wa = [1st-Person, Subject]
(b) ma = [1st-Person, Object]
(c) ya = [2nd-Person, Subject]

(d) ni = [2nd-Person, Object]
(e) chi = [[1st-Person, Subject], [2nd-Person, Object]]

The specific functions of rules (3a-d) are quite transparent, of course, and contribute essentially, clearly, to the superordinate function of the whole grammar that includes them — the universal grammatical function of associating distinct meanings with distinct sounds. The *reason* why these rules exist in the grammar of Dakota is thus simply that they serve to generate such appropriately distinctive sound-meaning pairings as those given in (4).

(4) na*wa*žĩ = 'I'm standing'
na*ya*žĩ = 'You're standing'
a*ma*'i = 'He took me there'
a*ni*'i = 'He took you there'

And the existence of such pairings in the language is clearly also a *consequence* of the existence of rules (3a-d) in its grammar. Both clauses of the explicational definition of 'function' in (2) are satisfied here. The specification of such pairings is thus the function of these rules. Moreover, the function of the whole grammar of Dakota can be achieved only if this particular function is also achieved. And since this is a function of no part of the whole grammar other than rules (3a-d), it follows that these rules are functionally determined in the grammar of Dakota, and their existence in this grammar thereby explained.

For rule (3e), on the other hand, the task of functional analysis is clearly more complex. Thus if Dakota as a functional system is specified only by the rules of (3) and the sample sentences of (4), one would have to conclude that rule (3e) has no function at all — since the portmanteau pairing that it specifies would appear to have exactly the same range of possible uses and consequences as the combination of pairings specified by (3a) and (3d), rules that are individually independent of (3e), and much more general in their range of functionally determined uses or applications. Rule (3e) would thus seem to be only a functionally permissible characteristic of the grammar of Dakota — or at most a functionally justified one. More precisely, the only thing that would seem to be functionally determined here is the disjunction of either (3e) or the union of (3a) and (3d). In any event, (3e) would have no function of its own.

Why, in other words, should Dakota have a morpheme *chi*, with the complex meaning '1st-Person Subject and 2nd-Person Object', when it already has the jointly equivalent simpler morphemes *wa*, meaning '1st-Person Subject', and *ni*, meaning '2nd-Person Object'?

There is an answer to this question actually — in fact, a quite straightforward one. But it depends on a somewhat more detailed specification of the functional system of Dakota grammar, a more detailed characterization of the particular subtype, or species, of grammar to which this particular grammatical instrument belongs.

Like many other languages with bound pronominal constituents — and probably all such languages — Dakota observes certain strict constraints on the relative order of those constituents. For Dakota, as can be seen from the data in (5), the operant constraints are as indicated in (6) — a person-order constraint (6a) requiring the precedence of third-person pronominals over non-third-person and first person over second-person, and a case-order constraint (6b) requiring the precedence of object pronominals over subjects.

(5) (a) _awichawa_’i ’I took them there’
them-I
(*_awawicha_ ’i, *_amawicha_’i, *_awichama_’i)
(b) _awichaya_’i ’You took them there’
them-you
(*_ayawicha_’i, *_aniwicha_’i, *_awichani_’i)
(c) _amaya_’i ’You took me there’
me-you
(*_ayama_’i, *_aniwa_’i, *_awani_’i)

(6) (a) 3rd-Person < 1st-Person < 2nd-Person
(b) Object < Subject

Now if we consider the meaning ‘I took you there’, it is clear that, given only the simplex lexical rules (3a-d), there would be no _possible_ way to express this meaning in Dakota, since _either_ ordering of the simplex morphemes _wa_ and _ni_, as shown in (7), would result in a violation of one or the other of the language’s pronominal ordering constraints, (6a) and (6b).

(7) *_awani_’i (satisfies (6a); violates (6b))
*_aniwa_’i (satisfies (6b); violates (6a))

But it is precisely in this situation, of course, that the conditions for application of the complex lexical rule (3e) are met. And the application of this rule yields the correct expression for the meaning ‘I took you there’ in Dakota:

(8) _achi_’i = ‘I took you there’

This satisfies both of the pronominal ordering constraints, of course, since it includes only one pronominal morpheme — the portmanteau form _chi_, which expresses the union of the meanings of _wa_ and _ni_ by sequentially indivisible amalgamation. Given the grammar of Dakota as a whole, therefore, which includes the ordering constraints in (6) as well as the lexical rules of (3), the function of (3e) is no less obvious than the functions of the simplex rules (3a-d), and contributes no less directly to the universal grammatical function of sound-meaning association.

It is not just the *existence* of rules (3a-e), moreover, that is functionally determined in grammars of the Dakota type, but also their precise manner of *use* in all empirically appropriate derivations of words, phrases, and sentences by such grammars. For the essential functional goals of these rules to be attainable at all, in fact, there is only one *possible* way for them to be applied.

First, from the most general grammatical function of sound-meaning association, it follows that these rules can be appropriately used only for effecting the substitution of phonological for non-phonological representations in phonetically-directed derivations, and the substitution of non-phonological for phonological representations in semantically-directed derivations.[6] Any other possible manner of application would be not even functionally permissible, but simply directly incompatible with the over-riding association function of all grammars. The appropriate directed, or transformational, uses of these rules are thus fully determined by this function. In fact, the same functional constraint on directed use governs the application of all *other* lexical rules as well, in all grammars of natural language. Moreover, as I have shown elsewhere (Sanders 1971, 1972), there is considerable evidence that the directed uses of *all* types of grammatical rules are fully determined by their grammatical functions.

From inspection of the rules of (3), it is equally evident that the specific function of (3e) — to achieve sound-meaning pairings without violation of the pronominal ordering constraints in (6) — can in fact be achieved only if this rule takes applicational precedence over rules (3a) and (3d) in all phonetically-directed derivations where its conditions for possible application are met. Failure to observe this applicational precedence constraint would result in the bleeding of (3e) by prior application of (3a) or (3d) or both — and hence in the very violations that the application of (3e) could serve to avoid. The function of the latter rule thus demands its applicational precedence over the former ones. This is another clear instance, in other words, of the determination of instrumental use by the functions of instruments and their functional parts.

Once again, moreover, we find that this particular functional constraint on the application of rules in the grammar of Dakota is only a special case of a universal functionally-based constraint on use, which holds for the functional parts of *all* grammatical instruments. This is the universal principle of Proper Inclusion Precedence, which has been discussed and extensively exemplified in the recent literature on universally-determined rule-application.[7] This principle asserts that for any rules A and B in any grammar, if the structural description of Rule A properly includes that of Rule B, then A takes applicational precedence over B in all derivational uses of that grammar. Thus since the non-phonological member of rule (3e) properly includes the non-phonological members of both (3a) and (3d), it follows from Proper Inclusion Precedence that (3e) must be applied, rather than (3a) or (3d), whenever the conditions for its phonetically-directed application are met. This universal constraint on rule-application thus determines the empirically correct functional interaction of these rules for Dakota. The Proper Inclusion constraint itself, moreover, follows in turn, as shown in Sanders (1974a), simply as a natural consequence of the complementarity relation that holds between the contributory functions of all pairs of rules standing in a proper inclusion relation.

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[6] See footnote 2, and Sanders (1971, 1972).

The fact that the rules of (3) are also appropriately applied only in an obligatory rather than an optional manner has a functional explanation here too, of course, since any other manner of application would nullify their essential functional contributions to the superordinate association function of the whole grammar that includes them. Again, moreover, it is not just *these* rules whose manner of application is functionally determined, but, apparently, *all* rules of *all* grammars. Thus, as argued in Sanders (1974b), it seems that all constraints on the linguistic use of grammars are functionally determined — with respect to manner, as well as directionality and precedence of application.

We have seen, therefore, that both the existence and use of the Dakota lexical rules in (3) are fully determined by the universal grammatical function of sound-meaning association. Rule (3e) was seen to be so determined only for a certain subtype or species of grammatical instrument — a subtype that specifies bound pronominal forms and no principle of passive formation. All other facts about the existence and use of these rules were found to be functionally determined for all types of grammar.

The particular facts that have been used here to exemplify the linguistic application of the principles of functional analysis obviously constitute only a very limited and relatively quite simple domain for explanation. It is within such limited domains as this, though, that I believe the techniques and methodology of functional analysis can be most fruitfully investigated and developed, and that the foundational laws of a functional theory of grammar can be most readily discovered and established.

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[7] See Sanders (1974a), Koutsoudas, Sanders, and Noll (1974), and the various references cited therein.

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The Sexism of Language and the Language of Sexism

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Joseph Greenberg's writings include articles (e.g. Greenberg 1954 and 1963) on two quite general topics: the relation of a language to the speakers' perception and more generally to their 'world-view', and the existence of linguistic universals. This squib then, may be viewed as a comment on the convergence of these two types of inquiry.

The term *sexism* is a label for one pervasive aspect of English speaking societies. English morphology and syntax exhibit a well-known pattern of grammatical categories, namely the marking of the feminine gender as opposed to the unmarked status of the masculine.[1] Indeed, it is tempting to apply both the non-linguistic and linguistic observations more universally to societies and languages in general.[2]

The linguistic evidence is well-known; what is less clear is the relation of such evidence to sexist attitudes and behavior, and similarly what non-linguistic changes follow from or lead to linguistic change.

As has been often observed, there are three manifestations of the distinction between the unmarked masculine and the marked feminine: (1) suffixation, e.g. *hero-Ø/hero-ine*; (2) modification, e.g., *Ø-athlete/woman athlete*; and (3) neutralization of several kinds, e.g., the generic use of *man*. The three are related. Thus one can talk of a *woman poet*, or, more interestingly, because of the apparent contradiction, of a *lady mailman*, but not of a *male* or *man poetess*. Thus, those who inquire as to whether it is politically correct to refer to Sylvia Plath as a *poet* or *poet-ess* probably have missed the point: women can normally be referred to as either; men cannot.[3]

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[1] There are of course other syntactic and semantic asymmetries beside the use of the masculine as the unmarked category which reflect the same bias, many of which are in Lakoff 1975 and Saporta 1974.

[2] Even a cursory comparison of, say, English and Spanish (see Suardíaz 1973) shows differences in linguistic details; but what is clear is that the fundamental generalizations apply. The facts of English and Spanish can be viewed as symptomatic of the sexist attitudes of the two societies, which is not to say that differences in the linguistic facts can be correlated with differences in the non-linguistic manifestations of sexism. In other words, nothing can be concluded about Spanish-speaking as opposed to English-speaking societies as a consequence of, say, the gender agreement system of the former.

Of some interest are the exceptions such as *widow-Ø/widower* with suffixation for the masculine; or, *Ø-nurse/male nurse* with a masculine modifier. A student has remarked on his strange reaction to reading a catalogue for a college which had only recently accepted men, and where all pronouns referring to students were feminine.

Less obvious than the generic use of *man, guy*, etc., or the phenomenon of grammatical neutralization are certain lexical items and metaphors in English which illustrate essentially the same linguistic and non-linguistic features. To refer to a fundamental idea as *seminal*, or to a difficult exam as a *ball-buster*, or to a courageous person as *ballsy*, or the feeling of powerlessness as *impotence* is a form of lexical neutralization in which what is male is used generically; so, also, are words for masturbation, like *to jerk off*, that imply either an erection or ejaculation.

Conversely, it is instructive to examine those cases where the feminine is used generically. For example, both men and women can *bitch* 'complain', or be *old maids*. Thus a woman who is courageous is behaving like a man, whereas a man who is cranky is behaving like a woman. In thoroughbred racing, horses of either sex that have never won are referred to as *maidens*, and a horse that has won for the first time is said to have *broken its maiden*.[4]

There are of course numerous examples of what one might call specialization, that is, the use of a word to apply only to women, where one might expect it to apply equally to both sexes. So, for example, in clothing stores, both men and women have *underwear*, but only women have *undies* a word with sexual connotations.

It is now standard to refer to sexist language as merely a symptom of sexism (Lakoff 1975; Saporta 1974). Lakoff (1975:47) even asserts with some conviction but little evidence that "social change creates language change, not the reverse". However, most inequities, e.g. job discrimination, are symptoms in much the same sense. It therefore does not follow that efforts should not be directed toward their elimination. Symptoms often are painful.

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[3] The linguistic data for a suffix like *-ess* are not all that obvious. As opposed to *poet/poetess* or *Jew/Jewess*, a woman can be referred to only as a *princess*, not as a *prince*.

[4] In conversations during the writing of her thesis, Suardíaz pointed out that Nature was sexist, since the virginity of only females is observable. I suggested that she include this observation in her thesis but she ultimately decided not to, fearing that it might provide evidence for proponents of male supremacy. I suspect, however, that universal phenomena require universal explanations, and some of these may very well be related to biology. This of course does not mean that anything inevitably follows as a consequence of such biological differences; biology is a rationalization, not a rationale.

Conversely, it is naive to claim, for example, that racism has been reduced because most English speakers have learned to substitute *Black* for *Negro*. Not every linguistic change corresponds to a social change. Very little can be concluded about the speaker who now uses *Black*; but something probably can be concluded about the speaker who persists in using *nigger*. In short, the precise relation of language to attitudes is unclear, and consequently there is little basis for any generalization about the effect that change in one area may have on the other.

But one step in reducing the confusion is to acknowledge here what is so well-motivated elsewhere, namely something equivalent to the distinction between competence and performance. Both the English language and its speakers manifest sexist symptoms; the two are not mutually exclusive. The fact that both women and men can be referred to as *poets*, but only a woman can be referred to as a *poetess* is a fact about English; but the fact that a caption in a history textbook can refer to *pioneers and their wives* and not sound bizarre or ambiguous illustrates the need for assuming some interaction between linguistic knowledge and in this case beliefs and attitudes about women, marriage, heterosexuality, and, monogamy; hence, the title of this note: there are facts which might quite properly be said to illustrate the sexism of the English language and there are facts that illustrate the language usage of individuals and a society with sexist attitudes and beliefs.

However, having made this distinction, the correct political tactics are far from obvious. Thus, Lakoff, purportedly writing from a feminist perspective, argues that emphasis upon lexical and grammatical neutralization is misguided since it is not insidious. She advises focusing instead, on "those linguistic uses of which speakers themselves can be made aware, as they use them" and argues that one should "attempt to change only what can be changed" (1975:44). But both her example, the different meanings and usages of *mistress* and *master*, and the circularity in her wording suggest that she is begging the question.[5] All we know is that what many women find offensive doesn't offend Lakoff, and also that she thinks it's easier to change the meaning of *mistress* than the meaning of *mankind*. Neither her politics nor her linguistics seem particularly persuasive, since what is "insidious" and what "can be changed" are anything but clear.

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[5] Elsewhere (1975:30), Lakoff tries to make a similar point about the different connotations of the word *professional* when used to refer to men and women. Her judgement is that *He is a professional* is usually understood to mean that "he" is a doctor or a lawyer, but that *She is a professional* is used to mean that "she" is a prostitute. Here we presumably disagree on the facts. For me, both are normally understood to mean that the referent is a professional athlete. Nevertheless, her point could certainly be made for the expression *He/She is a tramp*.

The interaction of a sexist language and the attitudes and beliefs of a sexist society combine to produce a variety of linguistic phenomena ranging from the linguistically most transparent to the most opaque, and ranging too from less to more vicious, with no necessary correlation between the two dimensions. Confronted with these phenomena, each individual presumably calculates the 'cost' and 'potential benefit' of an attempt to effect a change, hopefully acknowledging that linguistic change does not necessarily imply a change in attitudes, but at the same time recognizing that linguistic change is not in itself trivial. Language may be symbolic, but it is not *merely* symbolic.

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Marginalia to Greenberg's Conception of Semiotics and Zoosemiotics

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> The special position of linguistics arises from its two-fold nature: as a part of the science of culture by virtue of its inclusion in the mass of socially transmitted tradition of human groups, and as a part of the nascent subject of semiotics, the science of sign behavior in general. . . . Since linguistics faces in these two directions, it should be aware of the implications for itself both of the semiotician's discussions of language and of the general science of culture. (Greenberg 1971:1)

"That linguistics is a part of semiotic is commonly admitted", Charles Morris noted, but adduced the works of only two European linguists, Saussure and Hjelmslev, and two American ones, Bloomfield and Greenberg, to document his claim (1964:62). Of this latter pair, the senior scholar never attempted to come to grips with any consequences of his own explicit recognition of this hierarchical relationship, although he had succinctly formulated it when asserting that "Linguistics is the chief contributor to semiotic" (Bloomfield 1939:55), echoing a view that can be traced back at least to Locke, in 1690, and that is repeated ever more insistently by contemporary linguists laboring in the wake of the Saussurean heritage. Greenberg, however, is one of the few early contributors to the field to have seriously faced up to at least. some of the implications of looking at both natural languages and systems of animal communication from a semiotic point of view; (Chomsky [1959:218] by no means exaggerated when characterizing "Greenberg's proposals [as] the most carefully worked out of their kind . . ."). Nevertheless, it should be noted that Greenberg's semiotic evidently derives directly from that of Morris (with overtones of Carnap), and has, accordingly, remained predominantly behaviorist in motivation and orientation. In paying this tribute to my old friend and erstwhile collaborator (Osgood and Sebeok 1965), I would like to provide a few remarks — hardly more than annotations, really — specifically concerned with some of the issues raised, or, at any rate, implied, by the multifaceted inquirer's ventures into the realm of signification.

As long as fifteen years ago, I clearly recall being struck by two incidental paragraphs of Greenberg's (1961:1144f.) about communication in bees. In particular, he introduced in this context the notion of a universal metalanguage — metasemiotic would be a more accurate term — observing that "Anything the bees can say we can translate into human language, but there are an enormous number of things . . . which bees cannot translate from our language". The underlying principle of intersemiotic transmutability was most lucidly — perhaps initially — enunciated by Hjelmslev (1953:70): "In practice, a language is a semiotic into which all other semiotics may be translated — both all other languages, and all other conceivable semiotic structures". This, having been variously restated by prominent linguists, has since been elevated to dogma. Recently, for instance, it was most starkly spelled out by Shaumjan (1977) as follows: cognitive flexibility — owing to the productivity of natural language, reinforced by its attributes of richness and variability — is the feature which "makes it possible always to translate a message expressed in some sign system into a message expressed in a natural language, whereas the reverse is not true: not every message expressed in a natural language may be translated into a message expressed in some other sign system". (Cf. also Greenberg's own formulation [1957:64]: "Even when, as is possible in the case of gestures, we may learn them before language and independently of language, we may later explain them in terms of language, but never vice versa.") I would like to question whether the first half of this *ex cathedra* declaration has empirical support. Before doing so, however, I wish to return briefly to the problem of metacommunication in the animal kingdom that I have already alluded to in several previous articles (Sebeok 1963:458 ff., 1956:6 f.).

I assume that a metacommunicative operation is said to have taken place whenever meanings were elicited, and acted upon, by messages referring to a code. This is a type of semiosis found even in insects. Thus it is well known that honeybees often exclude intraspecific foreign workers — the guard bees may even kill them when food is scarce — while admitting to their nest colony certified members. The crucial decision as to membership appears to be made by recognition of odors acquired from the environment (although the possibility of a genetic component in the highly eusocial bees has not been ruled out). I have previously compared the display of the open scent gland of a returning worker to a pass badge with a duplex function: it is used both as its own designation and, autonomously, as a message referring to the *Apis* code, i.e., a metacommunicative message (Sebeok, *ibid.*; cf. Michener 1974:223).

The *locus classicus* of metacommunicative signing is, of course, to be found in mammalian play invitation, first described in dogs by Darwin (1872:63) with characteristic charm: "There seems . . . some degree of instinctive knowledge in puppies . . . that they must not use their sharp little teeth . . . too freely in their play. . . . When my terrier bites my hand in play, often snarling at the same time, if he bites too hard and I say *gently, gently*, he goes on biting, but answers me by a few wags of the tail, which seems to say 'Never mind, it is all fun.' " The theoretical foundations were then worked out by Bateson (1972:177-193) some eighty years afterwards, and a wide variety of metasigns employed to switch the signification of representation belonging to the object semiotic of different vertebrates (man included) have since been more or less catalogued (Aldis 1975:Ch. 9). Metacommunication may, moreover, occur in broadcasting status information, as in macaques and baboons. In sum, the phenomenon is so widespread that it can no longer be maintained that "only human language has this property" (Greenberg 1961:1144).

What about the proclamation of asymmetrical convertibility of codes, attributed to Hjelmslev, and statements, like Shaumyan's and Greenberg's, to the same effect? Consider, as one counterexample, the failure of all efforts hitherto to standardize bioacoustic terminology: the animal literature is full of a hodgepodge of incomprehensible terms drawn from physics, phonetics, poetry, music, and "the authors' own experience and imagination" (Broughton 1963:5), with a host of *ad hoc* onomatopoeisms, like the chirp of *Cercopithecus nictitans*, allegedly "sounding like 'tshe(a)k,' " or the chimpanzee's "loud WAA BARK" and its "WRAAAA CALL", which is to Jane van Lawick-Goodall "one of the most savage sounds of the African jungle" (1971:276), but evoking in each of her readers unverifiable phantasmagorias. Animal sounds are incapable of being paraphrased, and, even if replicated, e.g., on the highest fidelity of recordings, come across out of context so attenuated as to be immediately uninterpretable. What is missing in cases such as these is the clear and practical applicability of Peirce's concept of the interpretant: one gropes in vain for a set of linguistic signs to substitute instead of the significative unit employed by the speechless creature both to refer to his scarcely understood species-specific code and to the context of delivery, or *Umwelt*, through which the message fragment is aligned within the observed sequence of signs emitted.

The hallmark of man's humanity surely stems less from his language endowment as such than from the much more remarkable fact that he has two different, complementary communicative repertoires at his disposal, one verbal, the other not. The former is, clearly, in no sense an evolutionary replacement for the latter, which, far from having undergone conspicuous decay, continues to flourish in mankind with a complexity and intricacy surpassing those of comparable systems found elsewhere in the animal kingdom (cf. Greenberg 1957:62 — "Prelanguage signs continue to function even in human societies as gesture and otherwise"). The two codes serve overlapping yet largely distinct functions: "The nonverbal act can repeat, augment, illustrate, accent, or contradict the words; it can anticipate, coincide with, substitute for or follow the verbal behavior; and it can be unrelated to the verbal behavior" (Ekman & Friesen 1969:53); but, in many cases, the transmutation of nonverbal messages into verbal "is likely to introduce gross falsification," for a variety of reasons enumerated by Bateson (1972:419). Whereas the category of gestures Ekman and Friesen (1969:63) call "emblems," following a usage propagated by Efron (1972), is comprised of signs with a manifestly verbal interpretant, "a direct verbal translation, or dictionary definition, usually consisting of a word or two, or perhaps a phrase", other categories defy comprehensible verbal definition: these must be illustrated in handbooks by line drawings, photographs, or some other kind of iconic interpretant. This common predicament is faced, for instance, by Oléron (1974:12), who attempts typically to resolve it "par un commentaire des signes gestuels présentés parallèlement sous forme photographique," although he adds at once that his verbal description is unavoidably "schématique et allusif donc à l'insuffisance . . . d'une telle description".

While the force of Peirce's affirmation that "the meaning of a representation can be nothing but a representation" (1.339), which he called the interpretant, certainly stands, there is no compelling evidence for the view that every nonverbal sign must invariably address somebody verbally, create, that is, "an equivalent sign, or perhaps a more developed sign" (2.228) out of the language code. Indeed, a consideration of recent advances in split-brain studies, particularly of the effects of partial commissurotomy on interhemispheric integration tasks in human subjects (Gazzaniga 1975:568 f.), tends to make the contrary assumption suspect *a priori*. Neurological findings of the past decade suggest, extrapolating crudely from the modest data available so far, that the left hemisphere of our brain, in particular, the temporal-parietal lobe, specializes in verbal coding, or, more generally, sequential, temporal, and digital operations, while the opposite, possibly smaller half mutely manages spatial and stereognostic relationships. In normal people, the lateralized specialities of the various left and right brain areas can — and ordinarily do — make their contribution to the cerebral activities of their twin shell through the corpus callosum, but, as Bogen (1969) has recounted, certain dichotomies in behavior, having been assigned through the years to either the one or the other hemisphere, persist (cf. Dumas and Morgan 1975). The model of the brain function that seems to emerge from the new data is a dynamic one, producing an ultimately integrated behavioral response, but nonetheless admitting spheres of influence with only partially overlapping tasks. This picture of a dual processing system appears in good conformity with what we generally know about the interaction of the nonverbal with the verbal code, as well as with Bateson's specific views (1972:416-431) about redundancy and coding, but it fails to support the claims of Hjelmslev and his successors. It also compels one to ponder the full implications of Peirce's extraordinarily acute insight that "signs require at least two Quasi-minds . . . and although these two are at one (i.e., *are* one mind) in the sign itself, they must nevertheless be distinct. In the Sign they are, so to say, *welded*" (4.551).[1]

Let me turn next to the prescient essay, first presented in 1947, epitomized in the epigraph cited at the outset of this paper (Greenberg 1971:1-10). In his article, the author meditates upon some consequences of the Janus-like position of linguistics among the sciences. He tells us, quite correctly, that linguists — he must surely have had American linguists in mind — have, on the whole, "been more aware of their affiliations with cultural anthropology than with semiotics", a state of affairs that he attributes to "the recency of the semiotician's interest in the general features of language". Earlier in the same paragraph, he refers to semiotics as a "nascent subject", and the aspect of it he chooses to elaborate upon, in particular, is the trichotomy, "first advanced by Morris, and now widely adopted", of syntactics/semantics/pragmatics (1971:1 ff.). All of which raises a congeries of fascinating historical questions.

First, note Greenberg's insistent use of the lexical shape *semiotics*, which — his citations notwithstanding — can never be found in the works of either Morris or Carnap. They both used *semiotic*. Greenberg's 1947 usage curiously anticipated, by fifteen years, Margaret Mead's reintroduction and forceful advocacy of the former label in 1962, after which it spread rapidly and decisively the world over. I have discussed this entangled story in some detail (Sebeok 1976:47-58), but now regret having overlooked Greenberg's earlier idiosyncratic presentation, and cannot help wondering how the *-ics* form came to him, why he abandoned it a decade later (Greenberg 1957:1), and whether, as seems eminently plausible in retrospect, his article was familiar to Miss Mead.

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[1] For some preliminary though suggestive, if already controversial, applications of studies of the lateralization of cerebral functions to cross-cultural differences in information processing, see Paredes and Hepburn (1976), with ensuing discussion.

In passing, it might be worth noting that the abundance and diversity of the means of human communication has found ample expression in mythology as well — as Lévi-Strauss continues to insist in his scintillating analyses of the Oedipus myths (characterized by excessive communication) and their opposite, the Percival cycle (dealing with interrupted communication). Particular mention should be made in this connection of the semi-legendary narrative of Herodotus about the two sons of Croesus who were distinguished from one another by their respective semiotic competencies: one was gifted in the verbal arts to the highest degree, the other so bestial that he could make himself understood only by nonverbal devices. The fascinating resolution of this complicated relation, the central theme of which revolves around the mutual transformations prevailing between the worlds of verbal vs. nonverbal communication, will be presented in another paper (Sebeok and Brady, forthcoming).

As to the tripartition of semiotics, this actually derives from Peirce, as Rulon Wells had pointed out (Sebeok 1976:14). Nor has every linguist been equally enchanted with it; for one, Greenberg's late Columbia colleague, Uriel Weinreich, thought that it "turned out to be of little use in connection with natural sign phenomena" (*ibid.*:fn. 25). Nevertheless, many of us, myself included, found these distinctions serviceable in a variety of applications, at least as a provisional classificatory grid for sorting out, e.g., sign-processes in animals. A careful reading of Greenberg's elaboration of these three aspects of semiotics reveals that, in the course of it, he has creatively anticipated developments that have reached their peak in anthropology of the last decade under names such as "ethnosemantics", "ethnoscience", "folk taxonomy", or "formal analysis", "componential analysis", as well as more enduring and now semi-independent disciplines, as sociolinguistics, for which he used the warier expression "social linguistics" (1971:7). It is interesting to discover that, when speaking in a pragmatic frame of stylistic features, he is concerned "whether it is part of the standardized behavior of a people to speak at meals or keep silent", whether "a Sunday sermon will follow a certain organization beginning with a scriptural text and will employ a certain definable style", and with standardized greetings (1971:4). Topics such as these are now routinely considered in semiotic inquiry by workers ranging from Barthes to Kendon, but bring to my mind, above all, a neglected contemporary American classic of "cryptosemiotics" (Sebeok 1976:ii), the monumental book by Pike (1967), because Greenberg's influence is so pervasive there throughout (see Index:739).

It is, at first blush, puzzling that Greenberg should have placed so strong an emphasis upon the novelty of semiotics, especially in its filiation with linguistics. He had evidently read, for he cites it (1971:10, fn. 2), Morris' most famous book, published only the year before he delivered his paper, and must have known the chapter on "The History of Semiotics", where Morris delineated, if superficially, the "long and interesting history" of the subject. And Greenberg's familiarity with Saussure, who had professed in the first decade of the century that language is "rien de plus qu'un *cas particulier* de la Théorie des Signes", goes back to his graduate student days (1971:340). True, the historiography of semiotics is, even today, far from having been worked out, with numerous important gaps remaining to be filled in the future (Sebeok 1976:3-26, 150-156; see also Jakobson 1975). On the other hand, a discipline that has been traced back at least as far as to Hippocrates (c. 460-c. 377 B.C.) — who was designated "der Vater und Meister aller Semiotik" by Kleinpaul (Sebeok 1976:181) — can hardly be considered impenetrable either: a Genevese provincial *faux pas* claiming that "Le premier à concevoir cette science semble avoir été F. de Saussure . . ." (Sebeok 1976:153) can no more be condoned than the equally parochial transatlantic multiple solecism that allots the doctrine of signs to "Originally a branch of pragmatist philosophy (à la William James and Charles Sanders Peirce)" (Lamb and Makkai 1976:352). Greenberg is, of course, too sophisticated a scholar to commit such blunders, so one has to assume that his argument was shaped with long-range strategic intent, and in preparation for his more famous essay, "Language as a Sign System" (supplemented by three appendices [1957:1-17, 95-99]), where he attempted to demonstrate how to deal, in a technical way, with general formal properties of sign systems and, as a special case, of language which was then — indeed, still is — "a very important and insufficiently studied topic" (Chomsky 1959:203).

In a highly suggestive passage, Greenberg introduces "the dimension of time", thereby adding nine more combinations to the "total field of language, as here defined" (1971:7), his remaining nine permutations being synchronous. In semiotics, diachrony has two quite different applications. The first has to do with the evolutionary process by which a behavior pattern gradually alters to become increasingly effective as a sign (in biology, usually referred to by the less precise label, "display"). A preponderance of cases involve "ritualization" — a term originated, in 1914, by Julian Huxley — which has become a focus of biosemiotic research activities and coterminous with the entire field of ethology. Ethology, loosely referred to as the biological study of behavior, is thus more accurately defined as diachronic semiotics on a phylogenetic scale. There are very few durable anthropological studies of ritualization so far. Permit me to call attention to one of the best (almost unknown to Anglophone scholarship), because it should be grist for Greenberg's semiotic mill: this is Koenig's fascinating exploration of the ethogram of military uniforms in the perspective of their culture-historical development. He demonstrates that the practical functions that originally existed have long since been obliterated in order to maximize efficiency in communication (Koenig 1970:15-182). (Greenberg considered "the over-all degree of efficiency" of communication in a separate essay later on [1957:Ch. 5], containing a number of observations of interest to the semiotician, but space does not permit a review of these here.)

The second application of diachrony pertains to the development of semiotic competence and performance during the life span of an organism, and comprises a field I dubbed, in 1974, psychosemiotics (Sebeok 1976:141; see also Ullman 1975:781), or, as Greenberg particularized, "the syntactic, semantic, and pragmatic aspects, treated from the . . . individual. . . point of view. . . diachronically" (1971:7). (At the core of psychosemiotics lies, of course, psycholinguistics, to which he was likewise one of the first major American contributors with his perdurable interest in the connection between language universals and psychology [Osgood and Sebeok 1965].)

In rereading this 1947 essay, I was startled by Greenberg's remarks about chess, which, almost a quarter of a century afterwards, he expanded into a full-length address, "Is Language Like a Chess Game?" (Greenberg 1971:9, 330-352). He called chess a quasi-language because, "as the individual moves of the game seem to have no reference to anything outside themselves, the semantic dimension is lacking. . . ". The rules of the game are syntactic; the behavior of the players he assigned to the pragmatic aspect. Modern semiotic theory, however, endeavors to take into account the fact that even those sign systems that seem to be purely syntactic — notably including musical and nonrepresentational visual artistic products, glossolalic texts, etc. — allow for a semantic interpretation of their combinatorial possibilities. This was recently underlined by Jakobson — who has been keenly aware of the traditional comparison of natural languages with chess since at least 1927 — in pointing to the possibility of an introversive semiosis where the referential component may, to be sure, either be absent or minimal, but the emotive connotation is retained even so,[2] and where, therefore, "un renvoi d'un signe à un autre [est] présent dans le même contexte ou sous-entendu . . ." (1975:16).

Summing up, we see that Greenberg's writings at mid-century have prefigured two main trends in current semiotic practice. He was a direct catalyzing influence in furthering the advent of symbolic studies in anthropology; and he was a pioneer working toward the integration, in a rigorous way, of the study of sign systems into a viable mathematical theory.

The "rewarding field" that he envisioned at the interface of anthropology and semiotics, and of which he wisely said that "a mature science of culture is unlikely to emerge without" (1971:10), has now arrived with a vengeance (Turner 1975; Schwimmer 1977). The ongoing debate numbers among its contributors such modern masters as Douglas, Firth, Geertz, Leach, Lévi-Strauss, Singer, Victor Turner — to say nothing of the Tartu school and its epigones outside of the Soviet Union — who toil, under a variety of labels, old or new, and with assumptions that differ considerably in the extent of their veridical foundation, to clarify the universal problem of semiosis departing from what is known of cultural particulars: for, "simply stated", Turner tells us (1975:159), oversimplifying, "we master the world through signs, ourselves by symbols."

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[2] "That the meaning conveyed in a glossolalic utterance is emotional and social is clear in statements made by glossolalists" (Samarin 1972:164).

Greenberg has shown the relevance of mathematics to semiotics, particularly to linguistics, but results that Chomsky called nontrivial (1959:203) were hard to attain. They became a distinct possibility for the "soft" sciences only with the devisal by René Thom of his "catastrophe theory", and of its eventual applications to all sorts of discontinuous and divergent phenomena that notably include the generation of signs. The first approach in this new vein, published only three years ago, was Thom's marvellous sketch of a theory of symbolism (1974:229-251). It provides a relatively crude model for very complicated processes, but it does furnish a topological tool to grasp with what may be involved in semiosis as a fundamental domain of biological regulation.

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Introductory Notes to a Grammar of Cahuilla

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1. Preliminary remarks

These notes grew out of my preoccupation with writing a grammar of a particular language, Cahuilla, which is spoken in Southern California and belongs to the Uto-Aztecan family. The reader who would like to know how the conclusions put forward in this introduction were arrived at should read the appropriate chapters in the Grammar (Seiler 1976). Each of the principal chapters (Phonology, Morpho-Syntax, Syntax, and Semantics), and some of the major subchapters contain, in an introductory section, a synoptic view of the salient characteristics found on that particular level of description. The attention is focused on the interrelations among these characteristics and on the hierarchical structure of the interrelations. The Introduction to the Grammar as a whole — of which two sections are reproduced here in a modified version — tries to integrate the synoptic views of the different chapters into a series of comprehensive statements. The statements cluster around two topics: 1. A presentation of Cahuilla as a type of language. 2. Remarks on writing a grammar.

In connection with the first mentioned topic, one might wonder how a grammar of a single language could contribute to typology. In his penetrating analysis of typological methodologies, Joseph H. Greenberg (1974:24ff.) has described an individualising approach which is linked to portraiture of a single language. This approach stresses the differences rather than the similarities with other languages. In trying to explain linguistic phenomena it tends to transcend the domain of linguistics proper, advocating such uncontrollable concepts as that of 'Weltanschauung' and 'Sprachgeist'. In contrast to this approach, Greenberg has rightly stressed the need for a more nomothetic orientation of language typology, for the discovery of lawlike generalisations in languages by drawing bounds to the concept 'possible human language'; in short, for discovering universals, frequently implicational in form. Greenberg's outstanding contributions to fulfilling these requirements are well known to all of us.

The detailed study and grammatical description of a single language can indeed lead to typological statements. But a fruitful study of this kind must be different from the above mentioned individualizing approach. In order to write a grammar we must have a sufficiently developed concept of what is possible in human language. There seem to be three ways of arriving at such a concept: 1. The analytic-definitional way. 2. The way of accidental observation. 3. The synthetic way (corresponding to Kant's "synthetische Erkenntnisse a priori").[1] The third is the one that seems most promising in this context. It is synthetic inasmuch as the diversity of languages is essential for arriving at the notion of a 'possible human language'. Comparison with other languages, preferably of widely differing structure, is therefore one of the necessary prerequisites for writing an adequate grammar of a single language, although the comparative statements as such need not appear in that grammar.[2] The synthetic way is also a priori inasmuch as it should lead us to an understanding of a language (and of language in general) as a set of techniques — and not merely as a set of facts. Techniques — and not facts — serve certain definite purposes,[3] mainly of communication. The techniques of a single language for serving such purposes seem to me to constitute the dimensions along which we might typologize the languages of the world. I believe that it should ultimately be possible to typologically compare languages as total systems and not only particular aspects of languages. A tremendous number of facts are known about a great many languages. Rarely do we get a description of a language where the details are understood as manifestations of certain clearly defined techniques which can be understood teleonomically. Defining such techniques should be the task of a grammar of a single language. To the extent that this aim is realized, such a grammar contributes to language typology.

2. Cahuilla as a type.

Neither the investigator of a language nor the reader of the grammar should be content with a mere presentation of the facts of a language, no matter how well organized and insightful this may be. What we should like to know is what this language is like, i.e. the underlying design, so that we can compare it with other languages — provided we have a sufficiently clear idea of what they are like in their turn. This is, of course, the question of typology, and broaching this question is, I believe, as far as the grammarian of a single language can go.[4]

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[1] For an overview see the discussion by J.M.E. Moravcsik (1967:209ff.). I am indebted to Dr. Holger van den Boom for drawing my attention to these problems.

[2] Such comparisons can either be occasional and more accidental, or they can be more systematic. In the latter case, it is almost inevitable to concentrate on a few selected languages instead of a multitude of languages. The results of my comparisons with English and German are published in Seiler (1972, 1973, 1974, and 1975).

[3] On the concept of purpose and of teleonomy see the opening statement of the "Universalienprojekt" currently undertaken at the University of Cologne (Seiler 1973a:6-19).

Trying to answer the question of what a language is like and trying to enumerate all the facts of a language are of course not the same thing. And clearly, we shall never come any closer to the essence of the language if our grammar contains nothing but the bare facts. I find myself in agreement with Eugenio Coseriu's tenet (Coseriu 1966/1975:1f.) to the effect that a language system is not a system of 'facts' but rather a system of techniques. It would therefore seem to me senseless, if not impossible, to represent a language as a mere accumulation of facts.

Even if we are agreed on this point, our problems are not over; for then we are confronted by an even more difficult question: what is the basic design of this language? How can we hope to elucidate it? We do not have any established methodology at our disposal.[5] Edward Sapir (1921/1949:14ff.) in typologically comparing Takelma and Greek, has anticipated what is involved here and what should be the aim of future scholarly efforts. He speaks of some "great underlying groundplans", "some deep controlling impulse to form that dominates their drift". "If, therefore, we can only be sure of the intuitive similarity of two given languages, of their possession of the same submerged form-feeling, we need not be too much surprised to find that they seek and avoid certain linguistic developments in common. We are at present very far from able to define just what these fundamental form intuitions are."

I am now going to present what I think to constitute the essential traits of Cahuilla, which I understand as manifestations of certain basic techniques. For detailed accounts the reader is referred to the Grammar. And I repeat that the decisive organizing hypothesis which allows us to pull together all these various characteristics into a unified picture of a 'type' is that of teleonomy or purposiveness (Seiler 1973a). If it is the case — as Sapir (1921/1949:144) very aptly puts it — "that linguistic features that are easily thinkable apart from each other, that seem to have no necessary connection in theory, have nevertheless a tendency to cluster or to follow together in the wake of some deep controlling impulse to form

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[4] This reminds us of L. Hjelmslev's famous dictum (1966:129): "C'est seulement par la typologie que la linguistique s'élève à des points de vue tout à fait généraux et devient une science. Il est vrai qu'à cette possibilité glorieuse correspond pour le moment très peu de réalité. La tâche est proposée, mais encore loin d'être accomplie".

[5] One of the most illuminating treatments of these questions is Katznel'son's (1972/1974).

. . .", the reason for this is that these features concur in constituting basic techniques serving fundamental purposes, and that the posibilities for linguistic features to "cluster or to follow together" are limited, as are the purposes themselves.

One basic trait of Cahuilla is the strong preponderance of the descriptive over the labeling principle (see IV,1.1.4, and IV,5). Descriptivity is dominant in the realm of nouns. It serves the purpose of naming objects of nature, culture, or thinking. The descriptive principle consists in the transformation of a proposition into a term, syntactically speaking: of a sentence (basically a verb form) into a word (basically a noun). To give an example: in order to name the object 'arrow', a proposition describing its properties (hence our term 'descriptive') 'it is straightened' is transformed into a term: 'that which is straightened', 'the straightened one'. Such a term, which, as the translation equivalents indicate, is a relativized nominal, I shall call an absolute expression. It is absolute, because it leaves open no places to be filled by appropriate arguments. As a metapredication it asserts conformity between naming and object to be named: in our example: "'that which is straightened' applies [to the object under consideration]". The other major semantic class of expressions I shall call relational. In contradistinction to the absolute expressions, the relational ones require a definite number of places to be filled by appropriate arguments. E.g. the verb corresponding to the English 'straighten' is a two-place predicate. Certain Cahuilla nouns, e.g. kinship, body, or implement terms, are also relational. For every relational expression there is a corresponding absolute expression in the language, while the opposite is not true. Thus, the absolute expressions in Cahuilla are more basic than the relational ones.

There is a constant operator in the language effectuating the transformation from proposition to term, the so-called absolutive suffix, which has long been recognized as a noteworthy feature of Uto-Aztecan languages.

The transformation of a proposition into a term by means of an absolutivization has two corollaries: 1. The analyzability and morphological transparency of a considerable portion of all nominal expressions; e.g. in the word for 'arrow' the verb stem for 'to straighten' is immediately recognizable; such designations are thus (relatively) motivated. 2. A specialization or narrowing of the meaning of the term as compared with the meaning of the proposition: in the case of our example, while it is understandable that the term for 'arrow' should derive from the activity of straightening (which in the process of constructing an arrow is the decisive activity), it is by no means the case that every straightening results in an arrow.

The descriptive principle must have been alive in the language for a long time, and it is still operative. It can serve as an exemplary case for the notion of 'technique' as postulated by E. Coseriu (1966). With some terms the specialization of their meaning is rather advanced, and also their morphological shape has changed in the course of time so that from originally having been descriptive they move in the direction of becoming unanalyzable, unmotivated labels. But then, quite often, a new transformation 'proposition → term' is effectuated so that both synchronically and diachronically the process of absolutivization seems to be cyclically applicable. Thus, the color term for 'blue' appears as an absolutivized 'that which comes close to heaven', and the word for 'heaven' in turn is derived from 'the thing where carrying [of the sun?] takes place'.

If it was said above that the descriptive principle is dominant in Cahuilla this can be substantiated, above all, by the facts that it is applied cyclically, that it is constantly recurring in different domains of word formation, and that it organizes a great number of features of the languge which, otherwise, would appear unconnected.

The dominance of the descriptive technique has numerous consequences for the structure of the language. If absolute nouns by themselves may assert that, e.g., " 'that which is straightened' applies . . .", two things follow: 1. They are not simply nouns but actually represent an atomic sentence. 2. They do not refer to a specific, individual item, but instead, to a whole class; in the case of our example the translation could also be phrased as 'the straightened-like thing'. Now, if absolute nouns are the basis of the whole noun system, a strong predominance of classificatory expressions must be the consequence. The language may seek to achieve a balance. This is how I am inclined to explain the extraordinary wealth and frequency of individuative ('distributive') morphemes of Cahuilla (see II,2.1.4.2.2, and IV,4.2).

Another consequence of the descriptive technique whereby sentences are transformed into words is the importance of the word as a syntactic and semantic entity. An independent confirmation of this will be provided later when we go on to consider the verb.

A second basic trait of Cahuilla consists in what might be called 'syntactic compression'[6] (see III, Introduction). It will be shown that the domain of syntactic inquiry in this language quite frequently extends below the word level. In the morphosyntax a surprisingly high number of derivational affixes are homophonous or near-homophonous with independent verb roots. Such synchronic and diachronic processes as subject raising and predicate raising create single clauses where previously there were more than one, and "the new form very frequently turns out to be a single word predicate with a subject and possibly an object . . ." (Jacobs 1974:236). Just as a simple sentence, then, may go into an aboslute noun (descriptive principle), a complex sentence may go into a verb-predicate (principle of syntactic compression); and again, this latter process is accompanied by a specialization in meaning. What we shall find are manifold transitions from complex syntagms to compounds on the one hand, and to word groups on the other; and from word groups to affix constructions. These phenomena must be seen in the appropriate dynamic perspective: they point to the progressive integration of syntactic material within one and the same word, — a process of integration which is still operative in the language.

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[6] This term is borrowed from Roderick Jacobs's study "Syntactic compression and semantic change" (1974:232).

One major consequence of the dominance of the principle of syntactic compression seems to be that the expression of subordinative relations such as cause, finality, consecutivity and conditionality, is largely a matter of verb derivation (see III,6.1 - 6.5). No particular hypotactic elements (such as conjunctions) are found. In all the cases mentioned a paratactic expression is also possible, where subordination remains altogether unexpressed.

Both the descriptive principle and the principle of syntactic compression underline the important role of the word as a unit. And both principles are reflected in the phonology and the morphophonemics of this language. We shall find (see I,2) that little fusion exists between the stem and inflectional affixes; and little fusion also between root and derivational affixes. There is little obliteration of morpheme boundaries by morphophonemic processes. A characteristic process on the contrary, that of glottalisation (I,2.6) serves to separate outer-layer elements from inner-layer structures within the word.

A final basic trait — which fits well with the other traits mentioned — I term the principle of 'weak centralization'. It has a wide application ranging from phonology over morphology and syntax to semantics.

In phonology (see I,1.2) the principle is manifested by a relatively even distribution of the energies of loudness and pitch over the entire stress unit, which in this language is the word. In contrast to languages with strongly centralizing accent there is not one single place in the word which attracts all the energy and leaves all the other segments in a weakened position, but there is regular alternation between accented and unaccented segments.

In morpho-syntax, syntax, and semantics the principle influences the organization of such 'roles' as the agent, object, localization, time, and circumstances within the sentence. It is manifested by a lack of monopolization. E.g. a pronominal element pertaining to one specific function like the subject, or the object, may be appended not only to the verb but also to an adverb, and even to a conjunctive particle 'and' (see I,2.1.2). As one might expect, the ties between pronominal prefixes and the verb stem are rather loose in Cahuilla. Pre- and postpositions as indicators of place, time, and circumstances may be appended to nouns, to verbs, and to adverbs. Certain deictic elements may equally well combine with pronouns, verbs, and adverbs.

It is important to note in this context that the translated equivalent of an English sentence most often represents an aggregate consisting of several atomic sentences: absolute nouns, as we have seen, are atomic sentences (" 'x' applies", "it is an 'x' "). Verb forms also represent full-fledged sentences. The same holds for independent pronouns ("it is I"), and even for adverbs ("it is in this direction"). Given such a situation, one might well wonder how such aggregates can become organized into what we would call a sentence. This is where the clitics come in (see II,2.2). Both because of their number and because of the frequency with which they appear in the texts, the clitics are an extremely important feature of the language. On the phonological level they connect with the alternating, weakly centralizing stress pattern. And functionally they coordinate or subordinate, they serve to distinguish topic and comment, to mark quotation, truth, validity, quantification, etc.

In lieu of a summary let us ask — and briefly answer — the question: what does this typological picture reveal to us about the language?

It shows us how Cahuilla solves a number of basic problems of language communication:

1) The problems of reference, of referring to objects, of naming an infinite multitude of things by finite means: by predication.

2) The problem of keeping naming and predication distinct: by absolutivization.

3) The problem of organising a multitude of predications into a surveyable syntactic unit: by syntactic compression.

4) The problem of keeping systematically distinct the reference to classes and the reference to individuals: by individualization ('distributives').

5) The problem of distributing roles (agent, object, locale, etc.) over the sentence: by weak centralization.

6) The problem of foregrounding, backgrounding, coordination, expressing truth and validity: by clitic elements.

3. On writing a grammar

There has been much discussion in the literature of the last twenty years on how a grammar should be written, on what a complete grammar should account for, on the observational, descriptive, and explanatory adequacy of grammars. Unfortunately those who discuss these things are not identical with those who really write grammars. What they offer to substantiate their claims are at best fragments of grammars, or rather: fragments of sections of grammars, such as, for example, fragments of a section of syntax. The discrepancy between what these authors claim for their work (viz. completeness), and what they achieve sometimes verges on the grotesque.

What could one reasonably expect from a 'complete' grammar? Must it really account for every phenomenon that exists in the language? We know that this would be an open-ended task. There is dynamism in a language, there is variation and diversification at work almost every minute. Therefore a complete grammar, if such a thing is possible, cannot be exhaustive in the way characterised above.

It seems to me that a grammar deserves to be called complete to the extent that it succeeds in representing the language under study as a type. Such a grammar may omit certain details and still be fairly complete, provided the phenomena left out can be integrated into the picture in the wake of some basic characteristics analysed in the grammar. What then should we consider as the basic or typologically relevant traits? From my own experience I would say that those are the traits that have the greatest 'clustering' effect: the more far-reaching a trait can be shown to be, the more it serves to unify "linguistic features that are easily thinkable apart from each other, that seem to have no necessary connection in theory" (Sapir, 1921/1949:144), the more relevant is the trait. As I have shown in section 2, the basic typological traits of a language correspond to certain basic tasks which a language as an instrument of communication must fulfil. The reconstruction of these basic tasks is, of course, a matter of a general theory of language and cannot be further pursued here.

The task of the future, then, is to locate these basic traits. But before we embark on such investigation it might be well to recognize obstacles in the form of theoretical methodological misconceptions that must be overcome before we can hope to succeed.

One class of basic misconceptions concerns the grammatical levels, i.e. phonology, morphology, syntax, and semantics. There are two directions in which these misconceptions become operative, which I would call, respectively, compartmentalization and reductionism.

The endless and fruitless discussions about the boundaries between levels are well known. No matter whether one claims that there are or there are not definite boundaries between morphology and syntax, or between syntax and semantics, one is in either case concerned with compartments to be filled by facts. The view adopted in this Grammar is not one of compartments but rather one of perspectives. The preoccupations with separation or non-separation of levels, both emanating from a compartmental view, should be replaced by an inquiry into distinguishing qualities of the various levels.

Most certainly the levels of phonology, morphology, syntax, and semantics are distinct, in the sense that they represent different ways of looking at facts of language which may be different but which also may be one and the same. Linguistic facts have different dimensions corresponding to different communicative functions which they fulfill. Grammatical levels are nothing God-given; recognizing their justification means recognizing their connections with the different dimensions of communicative functions.

The other misconception, reductionism, operates by reducing certain grammatical levels to other levels. The experiments are well-known: linguists attempted to reduce semantics to syntax, phonology to morphophonemics, and now syntax to semantics. An important impulse for reductionism seems to come from the false ideal of a grammar conceived as a continuous algorithm. Nothing can be farther from reality than that. The unity in a language system cannot be grasped through an algorithm. An algorithm tends to obliterate the basically different regularities pertaining to the different grammatical levels. The unity must be sought in the basic traits which determine the typological 'look' of a language, and these basic traits begin to emerge precisely through an integrating view of the different regularities corresponding to the different levels. As an example I should cite the trait of 'weak centralization' manifested in the accent system on the one side, and manifested in the morpho-syntactic and syntactic systems on the other.

A related problem is the question of which model the grammarian should choose. There cannot be any single mould in which a grammar ought to be cast: at least among the models available up to this date I do not see any. But partial models may be very helpful and illuminating: e.g. predicate calculus for certain problems in semantics. In any case it should be borne in mind that a model is always an analogon, and that there will always be a point where the analogy ends and where linguistic reality is more comprehensive. Model theory is not to be equated with theory of science. The unity of a language system — and of language in general — is not to be sought within a model, nor within a theory of grammar, but rather within a theory of language.

A further problem is that of the apparent antinomy between synchrony and diachrony: does the grammarian have to choose either one or the other aspect? E. Coseriu has shown (1975:3f.) that to separate synchrony from diachrony is one thing, and to distinguish between the two is another: distinctions between the two must be made ('verschiedene Gesichtspunkte'), but they should not be separated. This means for us that a particular basic trait of a language, like the descriptive technique in Cahuilla, can only come to light when seen in a dynamic perspective which takes into account both the fossilized and the most recent manifestations.

A last point deserving to be mentioned is that of the 'intuitions of a native speaker'. In contradistinction to some other grammars of 'exotic' languages, this Grammar gives ample room to the treatment of semantic phenomena. I wish to contradict the still widespread belief that only native speakers can do adequate descriptions of their own language — and of semantic regularities in particular. It is true that one must have a very intimate knowledge of a language in order to fully understand the basic principles at work in the process of signification. But the belief that one cannot acquire such a knowledge is unwarranted.

To a not inconsiderable extent this work was motivated by the conviction that the study of the semantic regularities of an American Indian language is both necessary and possible.

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Rhetoric, Ritual and Politics:

The *Zabyouya* of Mossi Rulers, and U.S. Presidents' Inaugural Addresses

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Language, in the form of rhetoric, is an essential element of politics, the art or science of guiding or ruling people. In contrast to force, which seeks to coerce people to behave in a certain manner, rhetoric is used to obtain their voluntary compliance. And while force can and does induce people to act against their will, it is insufficient to create that sense of community that makes social life possible. Sooner or later force or the threat of force, as an arbiter of human behavior, must give way to shared attitudes on the part of the powerful and those subject to their power. This, of course, can only be done through language, whose symbols represent agreed upon meanings among its users and therefore provide the basis for understanding between them. Rhetoric then has the capacity to induce cooperation between human beings, who "by nature respond to symbols" (Burke 1950:43).

An effective political leader seeks to win the cooperation of his people by the careful use of symbols that are meaningful to them. He chooses those symbols that overtly and covertly express the values of a society in order to condition the attitudes, as well as influence the behavior, of his followers. By evoking commonly shared sentiments and beliefs, the politician attempts to persuade his audience that he understands and identifies himself with their interests. He also seeks to convince his public that he has an unusual insight into their hopes and fears and could be trusted to take care of these. The politician by means of rhetoric attempts to gain power over people with their consent and without the use of force. Nonetheless, given the nature of politics and government, dealing as they do with competing interests and therefore, conflict, the politician must indicate that he could deal with these problems of human society. The result is that the rhetoric of politics, even though designed to gain power without the use of force, usually contains symbols dealing with force. The rhetoric of the political leader promises security to friends and supporters and enmity or threats to real or potential enemies.

The rhetoric of politics is often used in a ritual context. As Gluckman (1962:42) once remarked, rituals "are built out of the very texture of social relations, each person having to perform symbolic actions, or undergo symbolic operations, which emphasize his role in relation to the other participants in the ceremony", Rituals thereby provide the framework in which the political leader, taking advantage of the sense of the sacred, uses symbols of rhetoric to achieve practical or secular ends. Often operating in circumstances in which social relations are strained or disjointed, the leader reaffirms the values of the group or society and by so doing attempts to restore its coherence. This is especially true at the end of an election contest during which members of a community have become estranged. A candidate struggling for power often emphasizes and exploits the weaknesses in the society in the hope of persuading people to support his own claim to be capable of strengthening the body politic. Unfortunately, the selection of a candidate seldom heals the wounds inflicted upon individuals and groups during the campaign. It usually takes what has been called a "constitutive ritual" to do so (Gluckman 1962:23, 32 ff.). The victor and the vanquished usually come together in a ritual, and the victor by using the proper symbols in his rhetoric attempts to secure the support of his erstwhile enemies or detractors (cf. Greenberg 1971:294). Rituals of this kind are not specific to small-scale societies where, because of the relative absence of power, sacred symbols are used to engender social and political cohesion (Van Gennep 1909; Durkheim 1913; Gluckman 1962). This complex of rhetoric, ritual and politics is often used to enhance authority rooted in secular power when there is also the felt need to appeal to the supernatural to sanction the use of this power (Beattie, 1964:154).

The traditional rulers of the Mossi people in Upper Volta employ such rhetoric by pronouncing *zabyouya* (literally 'fighting names' from *zabre* 'to fight'; *youya* 'names') during their installation ceremonies. The function of these *zabyouya* is to promise good health, peace and prosperity to their subjects; to pledge amity to their loyal supporters; and to warn actual or potential enemies against disturbing the tranquility of their commands (Skinner 1964:54; Tiendrébéogo 1964a:207). By the clever use of such symbols as 'rain', 'fertility', 'power', and 'prosperity' the Mossi ruler attempts to evoke in his subjects feelings of awe, security, unity, and well-being. Within the declarative statements or proverbs which he uses as his *zabyouya*, he attempts to highlight some aspect of his personal character which he hopes will give solace to his supporters and frighten his detractors. He usually seeks to 'name a name' for himself, that is, to give himself an official title, when he pronounces his *zabyouya*. Nevertheless, the Mossi have been known to choose from the symbols of the *zabyouya* a title not especially flattering to the author. They have also been known to accept the title implied in the *zabyouya*, but to attribute other meanings to the symbol (Skinner 1964:153).

The Mossi rulers' need to demonstrate personal leadership qualities in a combative if rhetorical way is due, in part, to the nature of their political system. The Mossi conquest state, like other African political organizations of this type, is not structurally strong. The right to rule is therefore not automatic but devolves to the person who can prove that he has the ability to command. The death of an incumbent ruler can and usually does lead to political instability. In order to avoid too hazardous an interregnum the people are kept *ritually ignorant* of the death of a king. Only when the electors are ready to choose his successor are the people told of a monarch's demise. Even then, there is some real or ritual violence as the numerous candidates vie for the vacant office. These men lobby, shift loyalties, engage in intrigues and bargain for allies in order to be elected. The hope and expectation is that out of this struggle will emerge the person best qualified to rule. Thus, the tumultuous interregnum has some benefits for Mossi society. In this they resemble the ruling faction in the erstwhile Ankole Kingdom of Uganda. According to Oberg, "The Bahima demanded that the strongest of the king's sons should be their leader and that the test should be one of war. The brothers must fight among themselves until one of them alone remained alive in Ankole Kingdom to claim the drum and the mugabeship" (1940:157-158).

Nevertheless, once the interregnum is over, the new leader in such states has to take steps to restore the confidence of the people in their government. The people need to be assured that he has the capacity and the will to restore calm and harmony in the body politic. To do so, the Mossi ruler uses all of the rhetoric at his command in order to persuade his subjects that all is well.

The Mossi ruler who vaunts his fighting ability on being elected to office seeks by so doing to indicate that he can follow in the great tradition of his royal ancestors. According to the legends which serve as its mythic charter, Mossi society arose in the eleventh or twelfth century as a result of the military expansion of the Dagomba and Mamprussi peoples from the region now known as Ghana into the Sahel (Skinner 1958; cf. Fage 1964:177-191).

The Mossi claim descent from Nyennega, the daughter of a Dagomba ruler, who fled from her father's home and married a hunter named Riallé, who had also left his father's country as a result of a quarrel over the kingship. The product of their union was a son called Ouedraogo in honor of the stallion that carried his mother to the north. At the age of fifteen, Ouedraogo went south to Dagomba to visit his grandfather and was given four horses and fifty cows. Then when he left Dagomba country to return home many Dagomba horsemen followed him, because their country was overcrowded. Ouedraogo and his followers rode northward, conquered the Bussansi, and decided to live in a place called Tankurn (Tengkodogo — old country). Here he married a Bussansi woman called Pouiriketa, who bore him three sons. Diaba Lompo, the eldest, was sent out to rule Fada N'Gourma and founded an independent state; the second, called Rawa, was sent to rule Zondema (now part of Yatenga), also an independent state; and the youngest, Zoungrana, remained with his father at Tengkodogo.

According to this legend, the Bussansi were only one of a group of small but warlike peoples inhabiting this region. The others were the Ninisi, the Kibissi, and the Gurunsi. These groups were constantly at war with one another and they made frequent alliances with stronger peoples to fight their enemies. A Ninisi chief visited Tengkodogo and, seeing the strength of the Dagomba, sought an alliance with Ouedraogo. This man sent Ouedraogo a woman called Pouitenga as a wife for Zoungrana. A few years later the Ninisi asked Ouedraogo to come and rule their country, but he died at a place called Sagabtenga before he could establish complete control of their territory. Zoungrana succeeded his father as head of the Mossi (a new nation resulting from the union of the Dagomba and the local inhabitants) but, wishing to remain at Tengkodogo, he sent his son Ouobri to complete the conquest of the country. The Ninisi were happy to have Ouobri as their sovereign since he was related to them through his mother. Ouobri subjugated or drove away those Ninisi, Kibissi, and Gurunsi who did not accept his rule. Naba Ouobri is regarded as the founder of the Ouagadougou dynasty, the most important of the dynasties issuing from Ouedraogo.

The consolidation of the Mossi state seems to have been a difficult task, and at various periods in its history some decentralization took place. During the reign of Komdimie, the fifth ruler, two of his relatives broke away from his control and formed principalities. The northern kingdom of Yatenga was created by a prince named Yadiga, and the state of Riziam was founded by a prince named Kouda. Despite opposition and constant attacks by Komdimie, the new states remained independent and Yatenga absorbed Zondema, the fief of Ouedraogo's son. At this same period Komdimie allegedly gave the provinces of Boussouma, Yako, Konquisitenga, and Lā to his sons, who called themselves Dima, meaning 'Submit only to God'. Another province called Kayao broke away from Komdimie's control, and its sovereign took the title of Dima when the supreme ruler was unable to conquer him. Most of the Dimas established courts similar to that of the supreme ruler and performed similar functions, but unlike the important independent entities of Tengkodogo, Fada N'Gourma, and Yatenga they recognized the supremacy of the Ouagadougou dynasty.

It was only after the reign of Naba Niandiffo (c. 1441-1511) that the Mossi rulers were able to confine their activities to the capital at Ouagadougou. Before this period most of them devoted their lives to subjugating the country. But with the installation (c. 1666) of Mogho Naba Ouaraga, the twentieth ruler, the political organization of the Mossi appears to have crystallized. This monarch established courts in Mossi society, and it was he who decreed that all future rulers of Mossi country should pronounce three *zabyouya* on being elected, and that they should choose a royal title or sobriquet (Tiendrébégo 1964a:25). The innovations of Mogho Naba Ouaraga established the political traditions for most of the kingdom and principalities of the Mossi people.

Ouagadougou, the most important political entity, is, like the lesser kingdoms, pyramidal in political structure. At the top is the Mogho Naba, a lineal descendant of Ouedraogo, and of Mogho Naba Ouobri, the first ruler of the Ouagadougou dynasty. Directly under the Mogho Naba are district chiefs who are descended from the cadet branches of the ruling family. The villages within the district are in turn ruled by the chiefs of the indigenous populations. In many of the villages the sons of the ruling family, the *nakomces*, form a noble class, above classes of commoners, serfs, and slaves. Classed among the commoners in many villages are the descendants of former district chiefs who have been deposed by the Mogho Nanamse (pl. of Mogho Naba). The reason the rulers give for the deposal of district chiefs is always disloyalty; but everyone recognizes that this is an excuse whereby the reigning sublineage deposes older branches and provides positions for its cadet or collateral branches.

The governing hierarchy of the Mossi is a lineage having component minor and minimal branches. Like most lineages, this ruling lineage holds an ideology that all of its members have equal access to its corporate assets. The most important asset of this lineage is, of course, its sovereignty, its right to rule. The *nam* is the symbol of Mossi sovereignty and is described as "that force of God which enables a mere man to rule over other men". The *nam* was first possessed by Ouedraogo and then by Mogho Naba Ouobri, and subsequently became the patrimony of all their descendants. This being the case, the ruling chief of any village, district, principality, or kingdom does not own the *nam* of that area; he is considered the temporary holder of it, and on his death it reverts to the collective descendants of Ouedraogo and Ouobri. Because it is not his, no man has the right to pass the *nam* on to some other person.

In actuality, this vaunted equality of access to the *nam* by all members of the ruling lineage is a legal fiction. And despite the fact that all the nobles declare they could go to Ouagadougou to seek the *nam* whenever a chief dies, in reality only the members of the dead chief's minimal lineage (often the descendants of his grandfather) present themselves as candidates. Indeed, of all the candidates, the eldest son of the dead ruler is the one most often chosen to be chief. If he is not qualified, then one of his younger brothers or one of the father's brothers or uncles is chosen. Yet, the fiction of equal access to the *nam* is important to the Mossi because it underlies their most important political axiom: "The only man who should rule is one who can keep the country." Regencies are avoided and persons with physical and character defects are barred. Moreover, this flexibility gives the electors a wide choice of candidates from whom to choose the person best fitted for chieftainship at any given period. The Mossi have always believed that it is difficult to rule men, and this is what they mean when they declare in Moré, the language of the Mossi: "Nanamsè toumdè ya yida fa fa" — 'The work of the chief is the most difficult of all.' For example, it is hardly accidental that the first ruler, Mogho Naba Ouobri, was succeeded by four of his brothers in turn instead of by his sons. The Mossi had not completely conquered the territory, and the young sons were incapable of handling the complex political situation. The graves of each of the successors to Ouobri in different parts of the country remain as markers to testify to the difficult task the early rulers had in controlling their realm.

The Mossi believed, and still believe, it is only when conflict develops after a ruler dies that the people realize how necessary and valuable a chief is. The death of a chief, especially of the Mogho Naba, is kept secret until the war minister arrives at the capital with his troops. Only then does the cry go up: "The fire has gone out!" And as soon as this is heard, disorder erupts throughout the land. Prisoners are released, thieves rifle the markets, the *nakomces*, or nobles, ride about the countryside doing whatever they wish. Reporting to his superior in Abijan about the events in Ouagadougou after Mogho Naba Kom died in 1942, the French commander wrote: "On Friday, March 13, 1942, young people, profiting from old custom, tried to steal things, but they were stopped and about one hundred were arrested" (Skinner 1960:397). Throughout all the chaos which attends the death of a king, the war minister remains calm unless an attempt is actually made to seize power. He never attempts to stop the public disorder or to catch thieves or murderers, because everyone believes that out of all the chaos will come a new appreciation for the task of the chief, and a cessation of the grumbling that the chief is greedy.

The pretenders to the Mossi *nam* begin to press their claims as soon as propriety allows. They present gifts to the Ouidi Naba (prime minister) and to the other ministers in an attempt to sway the issue. The Ouidi Naba finally calls a secret council composed of the provincial ministers, the Goungna Naba, the Larhalle Naba, and Kamsaogho Naba and the Tansoba, and recites to them the following formula: "The country does not have a chief, and it needs one. Among all the people who wish to be elected [*di nam*, 'eat the nam'], it is for you to choose the most worthy." To this the councillors respond: "Naba! You are our superior, and the right to make the choice rests upon you alone." Thus given a free hand, the Ouidi Naba chooses the most capable candidate. However, before announcing his choice, he proclaims to the Tansoba, "My heart is heavy because I fear that those persons whose hopes have not been fulfilled will resort to violence to get their way." The Tansoba responds, "That will be against tradition and justice. Do not fear. I am here with my army to see that your decision is respected." Having received the support of the Tansoba, the Ouidi Naba announces his choice to the other councillors. They reply to him, "Naba! You have expressed our will, and that of all the people." It is not to be understood from these formulas that the other councillors have no voice in selecting the candidate. They do in fact advise the Ouidi Naba concerning the best candidate, but these formulas emphasize that it is the Ouidi Naba, as prime minister, who is responsible for the choice.

The Ouidi Naba's choice of a new Mogho Naba is kept secret until the successful candidate is summoned for investiture. This occurs on the second night of the late Mogho Naba's funeral ceremony. Toward nightfall, the Ouidi Naba secretly dispatches a messenger to summon the successful candidate. The need for secrecy was demonstrated in 1890, when Boukary Koutou forced the committee to name him Mogho Naba. Mogho Naba Sanum had died without male issue, and all his brothers vied for the *nam*. One of them, Boukary Koutou, was felt to be ineligible because he had been exiled for leading a civil war against Sanum, but like his brothers he hastened to Ouagadougou. Boukary feared that the electors would not look favorably upon his claim, and when he failed to ascertain their intentions he decided upon a coup d'état. He gathered an army composed of his supporters and his Gurunsi slaves, and surrounded the compound in which the electors were gathered. One of the electors discovered the army during a break in the deliberations and reported his findings to the Ouidi Naba. The chief minister and his aides knew that Boukary Koutou was the only person capable of such a conspiracy. Fearing for their lives if they did not nominate him, they immediately sent a messenger to summon him as the successful candidate. Incidentally, Boukary Koutou referred to this incident in one of his *zabyouya*: "Nikiem kudré pwiré la lugh pa" ('A very old man knows how to avoid hurting his sides'). The implication was that had the electors not given him the *nam*, they would have been killed. Normally, however, there is no coercion of the ministers and the nominee is quietly brought before them.

Wearing a pair of trousers and a sheepskin mantle and carrying a spear in each hand, the nominee enters the courtyard of the compound through the women's door. He is preceded by the Samandé Nabila, who sprinkles the earth with water. He goes up to the councillors and salutes them. The Ouidi Naba then addresses him as follows: "Before your father [brother] died, did he designate you to be his successor?" The nominee replies, "No, Sire! My father has left you free to choose whom you wish, be he a blind man or a leper!" This question is asked three times, and the nominee responds three times. The Ouidi Naba then makes the following declaration: "I am giving you the *nam* of your father and grandfathers. You must try to conduct yourself as they did when they had the *nam*." The Ouidi Naba then lists the names of the territories over which the ruler has absolute power and authority. The new monarch raises his two spears in the air and pronounces three *zabyouya*.

The *zabyouya* of Naba Ouaraga, who began this tradition among the Mossi, confirm that this king was very concerned about his enemies. Mossi historians report that Ouaraga had previously lost out in a struggle for the *nam* when a Fulani counselor of his father chanced upon the installation ceremony, and forced the electors to name him Mogho Naba (Skinner 1964:210). This man, Mogho Naba Mottoba, died under mysterious circumstances (the drum history of some Mossi districts passes on his reign in silence) leaving chaos in his wake. During the interregnum there were many claimants to the throne including Ouarago, who was anxious to get the *nam* once possessed by his father Mogho Naba Oubi. This is apparently why Ouarago on being installed as Mogho Naba pronounced the following three *zabyouya*. In the first he declared: "Pig tont ouarga wardib na sam waghsé," which means literally 'The cultivators who try to cut weeds by the rock break their hoes.' The implication was that anyone who attempted to harm the Mogho Naba would be broken (*ouargé*) by him. For his second *zabyouré* (sing. of *zabyouya*) Ouarago said, "Kum samedé tont dibo di, dol'ef meg", which translates 'Do not borrow from Death because you will pay with your life.' Here the ruler warns that it would be foolish for anyone to attempt to harm the king. The third *zabyouré* was "Wam pu-to neda kyin laghem peba la midou fasda". meaning literally 'When an evil monkey goes to pick fruits from a tree, he harvests both the green fruits and the ripe ones.' Mogho Naba Ouaraga thereby indicated that he would not attempt to satisfy his detractors since such persons always took advantage of favors granted. He thus used his three *zabyouya* to tell the Mossi people that he was strong enough to protect himself from all his enemies whomsoever, and that he would not attempt to satisfy the demands of any of his detractors because such persons could never be satisfied.

An analysis of the forty-five *zabyouya* of the Mogho Nanamse who followed Mogho Naba Ouarago (c. 1441-1511 [Tiendrébéogo 1964b]) shows that they can be broken down into four categories: (a) those similar to the ones pronounced by Mogho Naba Ouaraga, and designed primarily to warn that the enemies of the king would be destroyed; (b) those promising certain benefits to the followers and supporters of the Mogho Naba; (c) those stressing the personal qualities of the rulers; and (d) a small number indicating the ruler's philosophical views.

A number of *zabyouya* in the first category, those used by the ruler to warn his enemies, reveal a great deal of subtlety and an excellent perception of the psychology of the Mossi people. Mogho Naba Baongo on being elected declared: "Siogo *baogho* tot nyobo nyod na gili kuli be tu kom kuli", which means literally 'If you burn the brush on the side of the pool between you and your house, you will have to go through the water to get home.' The implication here is that whoever tried to harm the Mogho Naba would always find the ruler standing in his way. Note here that the ruler used the symbols of water, burning brush, and a home — ideas that are especially important to Mossi cultivators. Mogho Naba Ouobogo, who ruled from 1889 to 1897, having overcome opposition to his enthronement, declared: "Kim-missi lagam koabgha ko bugus *'wobgho*." This means literally 'One hundred phantoms gathered together cannot frighten the elephant', a statement intended to reaffirm his power. He had previously demonstrated to the electors that he was prepared to seize power by force. And when in 1957 the contemporary Mogho Naba Kougri, who was experiencing great difficulties with the new politicians, was finally elected to office, he declared: "Yet somd *'kugri* pam ziga ta wikri lebgh togo." This means 'When the cornerstone has been well laid, it is henceforth difficult to remove it.' With these words the new king announced to all and sundry that although the politicians were busily scurrying about the Upper Volta attempting to gain votes and popularity, they could not easily remove the Mossi rulers, who had taken care of their country for centuries (Skinner 1972).

Although such *zabyouya* provided the official names for ruling Mogho Nanamse, the rulers often made other declarations which while not pertaining to their names did indicate their readiness to combat their enemies. Thus Naba Kom I used as his second *zabyouré* the following statement: "Simi wengignga zab ne djiguemde ti mig na ki koabgh ti silmisi na ki tusri zaghe", which means literally 'If a Fulani makes war against the lion, and if during that war one hundred cows are killed, one thousand Fulani will also be killed.' This statement was quite significant for Mossi, who have always distrusted the Fulani (see the case of the ill-fated Mogho Naba Mottoba above), and for whom the lion is not only the "king" of the beasts but also the totem of the royal family. The king sought to indicate by this statement that people who dared to fight the king not only would be slaughtered but would also lose their most valued property. Mogho Naba Ouobogo used a *zabyouré* to warn his enemies against troubling his rule: "Sing samegh ti tai-damb pwire la lugh pa sala." The meaning of this is: 'Those who violate the law of the singa [the altar of the elephant and lion hunters] shall never return to the forest.' Its significance was that the enemies of the Mogho Naba should renounce all attempts to harm him since he would always control the country. Mogho Naba Sawadogo's cautionary *zabyouré* declared: "Yibrogo salemb ouobgho poré kon pam nyand yé," meaning literally 'The tick bird can rub its beak on the back of an elephant, but it can never pick out its guts.' The ruler thus warned the princes who were competing with him for power that they should realize they could never gain the supreme power of the Mogho Naba.

Quite a number of Mogho Nanamse used *zabyouya* to express concern for the welfare of their subjects. Mogho Naba Karfo took his name from the *zabyouré* "Kar'nyaghda belem sonre pame nyaghe", meaning 'The *karfo* [an indigo-dyed robe] only shines at sunrise.' Poetically, this meant that after the dark night of the interregnum the appearance of the Mogho Naba, like the sun, would bring joy and happiness to all, but politically the ruler was suggesting to his subjects that their country could only be happy once the Mogho Naba had received the *nam*. Mogho Naba Siguiri, invoking the importance of the rainy season for food production in his arid country, declared at his enthronement: "*Siguiri* bum kô long néré yé" — 'Those who cultivate during the planting season are sure to be beautiful.' What this ruler wished his people to believe was that his sovereignty, like rain, would bring happiness to everyone. Similarly, the son of Siguiri, Mogho Naba Kom II, evoked the life-giving rains when he was installed. He told the assembly: "Kom su'tampo ti kulkyemes lad' moaghna" — 'When water flows swiftly over the soil, the rivers laugh with joy.' The Mogho Naba thereby expressed his belief that there was general satisfaction among the people over his election. When in 1942 Etienne Kongo was named Mogho Naba, he told his audience, "*Sagh* nid biegdo na manh, zwine la wôba" — 'When the rain falls the earth becomes fertile and even the blind and the leper rejoice.' Mogho Naba Sagha thus attempted to assure his people that his reign would bring happiness to everyone — even the poor and miserable. Mogho Naba Siguiri's second *zabyouré* is an example of how some monarchs attempt to lend levity to an otherwise very solemn ritual. He declared: "Pagh dighem doghnin be kisbugum," which is to say, 'The woman who precedes a man into the house puts out the light.' According to Mossi custom, a woman who did so indicated that she was ready to accord her favors. The Mogho Naba, knowing that Mossi men were always anxious about their wives (Skinner 1960), thereby promised his subjects that they would profit from his election, especially if they worked for the prosperity of their country.

Almost as numerous as *zabyouya* which incoming rulers used to reassure their people of peace, plenty and prosperity were those that offered a self-appraisal. Mogho Naba Kom I said: "Ned san yélé ti *kom* pas' gomdé, big gu sigri sagha kieng yilga segha, t'ef na banghé, ti *kom* gomda" — 'If one tells you that the rain does not speak, wait until the first great shower and go to the yilya [a tree growing near the river], then you will hear the water speak.' The Mogho Naba, playing on the word *kom* (water), thus assured his people that while it might be true that habitually he spoke softly, his voice would roar when he had to resolve important issues in his country. Mogho Naba Sagha I sought to imitate his father in his inaugural speech by also making allusions to water: "*Saghse* kwobgha lagem taba ka twe n peke ouobogo yé" — 'One hundred showers falling together cannot wash away the elephant.' Although this *zabyouré* might have suggested the name *Ouobogo* (elephant) for this Mogho Naba, the people chose the name *Sagha* (rain) instead. Mogho Naba Sanum, expressing his readiness to help all those who appealed to him, stated in his *zabyouré*: "Sanem bulg sin tuka pam nyodo" — 'Anyone who digs a pit in auriferous sands will enrich himself.'

A few *zabyouya* indicated that their authors had a philosophical turn of mind, though not many names were taken from such statements. The exception was Mogho Naba Sawadogo. This ruler declared: "*Sawadogo* ya yubeogo-soba, a pu nid ye ti ware, a nid ti mogho." Translated this means: 'Rain clouds do not have a good name. If they do not come, the country dries up; if they do come, they choke the country with weeds.' The king thereby promised to do his best, recognizing that in any case he would be criticized. Mogho Naba Kom I used a *zabyouré* to express the belief that it was impossible for the ordinary person to understand the concern of a ruler for his country: "Karem-bisi lagm koabgha kon bang Wendé" — 'Even a hundred Koranic students studying together cannot understand the nature of God.' The king thus openly stated that he did not expect his people to understand him or his work. Mogho Naba Doulougou, the first Muslim to be named ruler of the Mossi, revealed an attitude of tolerance that is not characteristic of Mossi rulers. In his inaugural address, he declared: "Bô-né ko nyok wendé yé ned baon pamé, wend yam" — 'People cannot understand God; those who are given something should take it, God knows about it.' In contrast to most Mossi rulers, whose avarice is often alluded to in the proverb "The snake [the chief] gets whatever is in the belly of the frog [the peasant]," this Mogho Naba assured his people that since all things, including wealth, are granted by an inscrutable God, they should not fear that their king would deprive them of their riches. Mogho Naba Kougri, also a Muslim, warned his people that "Nikiem-sôg rell' lalgha gind bona menga" — 'Whoever seeks to avoid an old man leaning against a wall, hurts himself.' The counsel here was that one should not try to avoid one's respondibilities because so doing leads to suffering in the end.

Lastly, a few Mogho Nanamse used the vehicle of the *zabyouya* speeches to thank those ministers who had elected them to office. Mogho Naba Koutou simply proclaimed "*Kuturogo* sin pama pus'meta" — 'He who acquires a strong [iron] house must thank the masons.' Mogho Naba Sagha II, who had feared he might be passed over by the electors in favor of his half-brother, said by some to be a few hours older than he, acknowledged in his speech "Bugum sin zirda be belem dado." By thus saying that 'A fire cannot provide heat if it lacks fuel' the Mogho Naba indicated to his electors that he was grateful for their having chosen him. He also added the following *zabyouré*: "Rasempwigh wedgha lal taga tilgh sebgho" — 'A tree that grows in the desert must seek the shelter of a mountain if it wishes to resist the wind.' Here the ruler is expressing his belief that he could not succeed as Mogho Naba without the support and help of his ministers.

After the Mogho Naba has pronounced his *zabyouya*, he has to go through a number of other important rituals designed to place him under both sacred and secular sanctions to rule well. Once his speech is completed, the Ouidi Naba takes the two spears from the new monarch and removes his sheepskin mantle. Then he gives him his new white clothes, which include a pair of trousers, a bonnet, and a sleeveless robe, all made for him by the people of the Soulougou ward in the capital. Next he is given a cushion made by the people of Baramimi district. The palace chamberlain, the Baloum Naba, then takes the closely guarded *namtibo*, the sacred amulets of the dynasty, and uses them in the preparation of a potion of millet beer mixed with millet-flour water, part of which is poured as a libation to the earth goddess, Tenga. The ruler and the assembled ministers all partake of the potion in a kind of communion. The ministers then shake the ruler's hand, an act thereafter forbidden, and depart for their own homes. The newly elected monarch secretes himself either at a courtier's home or elsewhere in the capital until daybreak. Tradition holds that is he should be killed before being officially proclaimed before his subjects as the new ruler, the assassin will become Mogho Naba.

The public ceremonies marking the official proclamation of the new ruler's accession to power take place on the following day. Early that morning, the monarch leaves his secret sleeping quarters and proceeds to the house of the Koumbi Naba [one of his courtiers]. Here he dresses in his white garments and mounts an old, unsaddled horse. The Baloum Naba then gives him a sack containing the *namtibo,* which he places over his shoulder, and the Kalzi Naba [a palace courtier] leads him out of the courtyard by the women's door. As the ruler's horse passes through the gate, his sister, the *Napoko* ('female ruler'), cries, "The sun has reappeared! The fire is relighted! The earth lives again!" A large crowd of musicians and warriors who have been alerted by the ministers shout and dance as they accompany the monarch, who circles the compound three times. The ruler then reenters the compound, and this time he comes out through the men's door as a sign of his full status. Here he is greeted by the Ouidi Naba, who proclaims in a loud voice, "Mossi people, here is the Mogho Naba!" The warriors shout and fire their muskets, and the musicians play. Then all the dignitaries and their followers solemnly prostrate themselves and pay homage and swear allegiance to their monarch. He, in turn, listens attentively when his ministers and some of the elder chiefs give him advice about how the affairs of state should be conducted. After each declaration of loyalty or word of counsel, the people shout in praise of their ruler. The Benéré Naba [the court historian], accompanied by his musicians, then recites the ruler's genealogy, announces the pledges the new monarch has made to his people, and acclaims him by his royal title, "Mogho Naba [X]". From this moment on, no child born during his reign can bear the ruler's name, and those persons who already bear it call themselves *Nab'yuré* ('king's name').

This complex — comprising rhetoric, ritual and politics — is found in many societies, non-African as well as African. Indeed it may be as universal as other aspects of culture (Greenberg 1971:295) and may be present, in the one extreme, in acephalous societies where politics as such is imbedded in 'nonpolitical' institutions, and at the other in the contemporary nation-states with their elaborate political cultures. Daryll Forde has described the rituals marking death and succession for membership in the ubiguitous associations among the Yakö; members of the Epoli society, and the older kinsmen of the deceased, made boastful speeches "about his wealth and the skill and energy with which he gained it, and ended by throwing his iron bar noisily to the ground." The object here was to assure the dead man that his association mates would be well treated by his kinsmen so that the association could continue to secure peace and health for the society (Forde 1962:117).

The complex of rhetoric, ritual and politics is very much present in the contemporary United States of America, whose constitution explicitly separates *church* from *state*. And while the transition from one leader to the other is usually peaceful (even in the face of assassinations), almost all United States Presidents make inaugural speeches that have many features in common with the *zabyouya* of Mossi rulers. As in any aspect of culture that has stood the test of time, these addresses, attempting as they do to invoke the basic values of Americans, tend to be highly stylized. One historian complained: "It must be conceded that, even in the field of political oratory, the inaugural address is an inferior art form. It is rarely an occasion for original thought or stimulating reflection. The platitude quotient tends to be high, the *rhetoric* stately and selfserving, the *ritual* obsessive, and the surprises few" (Schlesinger and Israel 1965:vii; italics mine). There is, however, a constant theme that runs through these inaugural addresses (Lott, 1961), as constant as those found in the *zabyouya* of the Mossi rulers. First of all, George Washington attempted to assure the American people, then suspicious of monarchy, that he was not ambitious. He said he would have preferred to remain a peaceful retiree rather than continue to serve the republic as he did during the Revolutionary War. He warned his listeners against the "corruption" that normally came with political office. He was especially concerned about "party animosities", and beseeched the party hotheads to give the new Constitution a chance. He concluded his address with the religious invocation: "we ought to be no less persuaded that the propitious smiles of *Heaven* can never be expected on a nation that disregards the *eternal rules* or order and right which *Heaven* itself has ordained; and since the preservation of the *sacred fire of liberty* and the *destiny* of the republican model of government are justly . . . staked on the experiment intrusted to the hands of the American people" (italics mine).

The themes and values evoked by Washington were to recur time and time again. Andrew Jackson indicated that he too did not crave high office but would respond to the honor done to him by the "zealous dedication" of his humble abilities to the service and good of the American people. As we shall see, the injunction to rise above party politics would occur again and again. Almost every President would thank the American public for placing the great stake of government in his hand. And the theme of the sacred fire would persist for generations. Franklin D. Roosevelt proclaimed, "If we lose that *sacred* fire, then we shall reject the destiny which Washington strove so valiantly and so triumphantly to establish." And later John F. Kennedy was to declare: "Let the word go forth from this time and place, to friend and foe alike, that the *torch* has been passed to a new generation of Americans — born in this century, tempered by war, disciplined by a hard and bitter peace, proud of our ancient heritage — and unwilling to witness or permit the slow undoing of those human rights to which this nation has always been committed, and to which we are committed today at home and around the world."

Perhaps because the American Republic emerged as the result of a struggle against a tyrannous king, American Presidents usually have addressed themselves in their inaugural speeches to the questions of life, liberty, and property. Washington started the tradition by supplicating to "that Almighty Being who rules over the universe, . . . that His benediction may consecrate to the liberties and happiness of the people of the United States a Government instituted by themselves for these essential purposes. . .". Jefferson assured the people that he intended to preside over "a wise and frugal government, which shall restrain men from injuring one another, shall leave them otherwise free to regulate their own pursuits of industry and improvement, and shall not take from the mouth of labor the bread it has earned. This is the sum of good government, and this is necessary to close the circle of our felicities." Martin Van Buren congratulated the American people that "The privileges, civil and religious, of the humblest individual are still sacredly protected at home. . .". Abraham Lincoln, as he contemplated the end of a terrible civil war that had disunited America, reached the heights of rhetorical eloquence when he used his inaugural speech to promise postwar reconciliation: "With malice towards none, with charity for all, with firmness in the right as God gives us to see the right . . . to do all which may achieve and cherish a just and lasting peace among ourselves and with all nations." And when faced with a Great Depression in which many Americans feared they had lost the possibility of making a living, Franklin D. Roosevelt declared: "The hopes of the Republic cannot forever tolerate either undeserved poverty or self-serving wealth. . . . In the face of great perils never before encountered, our strong purpose is to protect and to perpetuate the integrity of democracy."

As a general rule, American Presidents have attempted during their inaugural addresses to appease or to reconcile their former personal or party enemies. Thus Jefferson, faced with the emergence of strident party politics, assured his listeners that ". . . every difference of opinion is not a difference of principle. We are all Republicans, we are all Federalists. If there be any among us who would wish to dissolve this Union or to change its republican form, let them stand undisturbed as monuments of the safety with which error of opinion may be tolerated where reason is left to combat it." Alarmed by the prospects of civil strife, Abraham Lincoln sought to appease his detractors: "Apprehension seems to exist among the people of the Southern States that by the accession of a

Republican Administration their property and their peace and personal security are to be endangered." He assured them: "We are not enemies, but friends. We must not be enemies. Though passion may have strained it must not break our bonds of affection. The mystic chords of memory, stretching from every battlefield and patriot grave to every living heart and hearthstone all over this broad land, will yet swell the chorus of the Union, when again touched, as surely they will be, by the better angels of our nature."

No American President has been prepared to permit internal discord to imperil the country. When several states claimed the right to succession, which he feared would impair the Union, President Andrew Jackson warned that it was the "duty of all to yield a ready and patriotic submission to the laws constitutionally enacted, and thereby promote and strengthen a proper confidence in those institutions of the several states and of the United States which the people themselves have ordained for their own government." To this end he promised to seek compromises and concessions to preserve the Union. Yet he made it quite clear that he was prepared to use force if force proved necessary to save the country. Later, when the Civil War seemed imminent, Lincoln warned the rebels: "In *your* hands, my dissatisfied fellow-countrymen, and not in *mine*, is the momentous issue of civil war. The Government will not assail *you*. You can have no conflict without being yourselves the aggressors. *You* have no oath registered in heaven to destory the Government, while I have the most solemn one to 'preserve, protect, and defend it.' " When he took office during the depths of the Depression, Franklin D. Roosevelt believed that the people wanted him to take drastic measures to restore economic health. For his part he felt that the nation needed to overcome fear, that "nameless, unreasoning, unjustified terror which paralyzes needed efforts to convert retreat into advance". Now that the "money changers" had been thrown out from their high seats in "the temple of our civilization", Roosevelt felt that the people wanted direct, vigorous action. They had asked for "discipline and direction under leadership", he stated. "They have made me the present instrument of their wishes. In the spirit of the gift I take it."

Incoming American Presidents usually have been quite forceful in the language they have addressed to potential external enemies of the state. They have sought to leave no doubt that America would defend itself and its interests. When James Madison came to office in 1809, a period when Napoleon Bonaparte had conquered most of Europe, the new President declared that "The present situation of the world is indeed without parallel, and that of our own country full of difficulties." He told people not to panic, but swore "to keep within the requisite limits a standing military force, always remembering that an armed and trained militia is the firmest bulwark of republics." When President James Monroe came into power he felt that America had constantly to guard against foreigners infringing the rights of her citizens: "A people who fail to do it can scarcely be said to hold a place among independent nations. National honor is national property of the highest value. The sentiment in the mind of every citizen is national strength. It ought therefore to be cherished." President Wilson used his second inaugural speech on March 5, 1917, to hint that America might have to enter World War I: "We are provincials no longer," he declared. "The tragic events of the thirty months of vital turmoil through which we have just passed have made us citizens of the world. There can be no turning back. Our own fortunes as a nation are involved whether we would have it so or not." After World War II, America faced the challenge of what it considered to be a new enemy. In the words of President Dwight D. Eisenhower, this enemy was "internal communism and the power that it controls". In his inaugural address the President asserted: "To counter the threat of those who seek to rule by force, we must pay the costs of our needed military strength, and help to build the security of others." Finally, John F. Kennedy, facing the same challenge, assured the American people: "Let every nation know, whether it wishes us well or ill, that we shall pay any price, bear any burden, meet any hardship, support any friend, oppose any foe to assure the survival and the success of liberty."

Almost every President of the United States from Washington to Ford has ended his inaugural address with an appeal to God, thereby invoking the supernatural to sanction the rituals of politics. Washington beseeched "the benign Parent of the Human Race" to continue favoring the American people with his divine blessing. John Adams asked that "Being Who is supreme over all, the Patron of Order, the Fountain of Justice, and the Protector in all ages of the world of virtuous liberty" to continue his blessings upon America. Even Jefferson the erudite philosopher found it germane to invoke the help of "that Infinite Power which rules the destinies of the universe" to aid the councils of the nation to do what is best for "your peace and prosperity". Zachary Taylor asked "Divine Providence" to continue to bless the United States, and Ulysses S. Grant asked the "prayers of the nation to Almighty God in behalf of this consummation". William McKinley swore before "the Lord Most High" to uphold his oath of office. Warren G. Harding promised to walk humbly with his God, and Calvin Coolidge commended America to the "favor of Almighty God". Franklin D. Roosevelt ended every one of his four inaugural addresses with an appeal for help from God, and John F. Kennedy ended his address with the statement: ". . . let us go forth to lead the land we love, asking His blessing and His help, but knowing that here on earth God's work must truly be our own." Theodore Roosevelt made no mention of God in his address but appealed to the *ancestors* instead. He pledged to show "devotion to a lofty ideal, which made great the men who founded this Republic in the days of Washington, which made great the men who preserved this Republic in the days of Abraham Lincoln".

One interesting similarity between the inaugural addresses of the Mogho Nanamse and those of the American Presidents is that their speeches gave the title to their regimes. The Mossi rulers derived their ruling titles directly from their *zabyouya*, much as a number of American chiefs of State provided the elements by which their regimes would be named. Thus implicit in Franklin D. Roosevelt's addresses was the concept of the "New Deal", and President Harry Truman hinted broadly that he was after a "Fair Deal". The ringing rhetoric of John F. Kennedy boldly announced that he was determined to carry America across a "New Frontier", and Lyndon Johnson promised America a "Great Society". Rhetoric, used in ritual, appears to be universally harnessed in the interest of politics.

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Linguistic Typology and Linguistic Characterology

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Linguistic characterology, whose principles were formulated in the nineteen-twenties by the founder of the Prague linguistic school Vilém Mathesius and whose concrete specimens were presented by Mathesius himself and by his pupils,[1] is sometimes regarded as an essentially typological affair. Still, such classification of linguistic characterology is not quite up to the mark. What, then, is the mutual relation of the two linguistic approaches?

As early as 1928 Mathesius formulated the task of linguistic characterology as the establishment of those systemic features which are characteristic of the given language and which therefore are particularly important both in learning that language and translating into it from some other language. (For English, such characteristic features are, e.g., its nominal trend in syntax as well as its preference for passive, as opposed to active, predications). On the other hand, linguistic typology attempts to classify the given language according to the manner and extent in which it participates in those (mainly grammatical) features which are regarded as characteristic of some specific type of language structure — traditionally, one used to distinguish, as is well known, between the isolationist, agglutinative and inflexional types.

The Prague scholar Vladimír Skalička was probably the first to emphasize the fact that, as a rule, languages constitute mixed types, not 'pure' ones (1935). This fact has certainly much contributed to the introduction into typological studies of statistical research, enabling the linguist to assess the degree of this or that specific type in the classification of the given language from the typological viewpoint, and at the same time making easier and more exact the mutual typological comparison of different language systems. In its turn, the statistical research in linguistic typology certainly has had its share in increasing the linguist's interest in language universals (in the research of which Prof. J. Greenberg has been one of the pioneers) which now appears to be most closely linked to modern typological research (see Greenberg 1966).

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[1] See Mathesius (1928), Poldauf (1954, 1963), Firbas (1961), Vachek (1961).

It might be asked what is the relation of linguistic characterology to the other now very popular trend of linguistic research, generally termed contrastive linguistics (though, perhaps, confrontational linguistics would be a more suitable label: see Nickel 1971). The answer to this question is that the term contrastive linguistics denotes the method of synchronistic comparison of languages (Mathesius, in fact, was one of its pioneers, though he availed himself of a different term, viz. that of "analytical comparison"), whereas the other term, linguistic characterology, refers to the concrete result obtained by using that method. Thus the mutual relation of the two terms corresponds to what are called, in the typological sphere, method of typological research as opposed to a concrete typological classification, obtained by that method, of this or that particular language.

After this rough-and-ready delimitation of the spheres of linguistic typology and linguistic characterology, we may proceed to look more closely at the essential differences of the two approaches. There appear to be two important specific kinds of such differences which we want to comment on here.

The first difference obviously is that, unlike research in linguistic typology, the study aimed at linguistic characterology is not so much (if at all) interested in language universals, i.e. in establishing which of the features of the examined language system can be regarded as necessarily present in any language system. This lack of interest in language universals may seem, at first sight, to be a drawback of the discussed linguistic approach. Still, a closer view will reveal that this is not necessarily so. However important may be the study of language universals for looking more deeply into the essence of the human faculty of speech (for which the French use the label 'langage'), it cannot be overlooked that the number of language universals is necessarily very low and their character is therefore a highly abstract one. In other words, the features characteristic of the given language system, which are in the focus of interest of scholars striving at its linguistic characterology, will of necessity fall through the sieve, being not of universal but of particular character. Besides, there is one thing which essentially matters in linguistic characterology but is obviously missing in the quest for language universals: it is the effort at finding out the interrelations of the items of the examined language system and at pointing out their differences (or identities) with the corresponding interrelations found in the language system to which the examined language system is being compared. In other words, the procedure aimed at obtaining linguistic characterology respects (and, in fact demonstrates) the essentially structural character of the system of language, while in the study of linguistic typology, at least if it is primarily interested in language universals, this regard for structural character of language is necessarily shifted into the background.[2] So much, then, for the first difference of the two compared linguistic approaches.

While the just discussed first difference was closely connected with the structuralist conception of language, the conception characterizing not only Mathesius but the whole of the Prague linguistic group, the second difference of the two approaches is intimately linked to the functionalist conception of language. This feature is probably even more essential for the conception of the Prague school than its structuralist orientation, and has justly been regarded as specific to it.[3] Mathesius insisted on the necessity of taking as a starting point of linguistic comparison not the form of language utterances but their function. More concretely, a scholar attempting to establish a linguistic characterology of a given language examines the means by which that language and some other language satisfy the identical needs of expression existing in the two language communities (e.g., the expression of possession, of local and/or temporal relations of persons and/or objects, etc.). Since the needs of expression ascertainable in different language communities may be declared to be basically identical, this functionalist method of comparison is found to be very useful in its practical application for the purposes of language teaching, of translation, interpretation, etc.

On the contrary, traditional typological research is inspired not so much by the function of the compared language items but rather by the differences of their formal structures. Of course, it is taken for granted that the compared items (e.g., forms of declension, conjugation, etc.) have roughly identical meanings, but such means are regularly very formal and abstract, and the linguist's attention is focused much more on the formal make-up of the compared items and on their classification into more abstract formal types than on the finer semantic shades of content mediated by such forms.[4] This is, of course, even more true about those typological studies which are mainly concerned with the establishing of language universals. Such studies are clearly more or less taxonomic in their basic orientation. Moreover, in their quest for the universal features they naturally have to disregard what is specific for the examined language and what, as pointed out here above, is the main concern of research done in the field of linguistic characterology.

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[2] Typological research not focused on statistical research is more sensitive to structural interrelations (see e.g. Skalička 1966).

[3] Thus, e.g., Zvegincev, who labels his chapter on the Prague school (1965:II, 121-166) as "funkcional'naja lingvistika".

[4] This is also true of Skalička's treatment of typological problems (1966).

Our arguments presented here should not be regarded as meant to disparage typological research and the effort to establish language universals: in its own sphere, such research is certainly most valuable and problems covered by it are by no means unimportant. We only wanted to draw a distinct line between it and research in linguistic characterology and to show that the field covered by the latter cannot be neglected by linguistic studies.

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